GINEERING
BRARY

JAN 11 1950 January 9, 1950

STEEL

The Magazine of Metalworking and Metalproducing

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MESTA FORGED HARDENED STEEL WORKING ROLLS *for Cold Mills*

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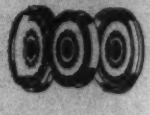

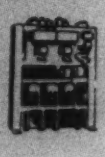

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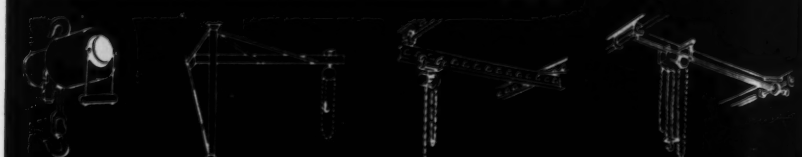

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Behind the Scenes . . .

No Company

We note with mild surprise the national interest aroused by the unsuccessful transit strike in Cleveland a short time ago. According to this story told by a friend of ours at American Steel & Wire Co., even a few Clevelanders knew nothing of it.

The American Steel & Wire man drove to work on the first morning of the walkout. He would never have known about it if he hadn't turned on the radio of his car to hear the weather report. A strike had been voted at 12:30 that morning. The announcer was relaying a request from the mayor urging all autoists to pick up stranded transit riders.

He wished to do his part, so drew up to the first bus stop he found. Two women were standing there.

"Would you like a ride downtown?" he asked.

"No, thank you." Cool politeness.

"Well, there are no buses today."

The two women looked at each other knowingly. "Oh, yeah," one of them said.

He almost stripped the gears of his car as he drove away.

World Affairs Division

It is not often that we comment on international affairs, but here's a fact that could have tremendous significance, at least to the boys who roll the ivories. The United Nations' telephone number at Lake Success, N. Y., is Fieldstone 7-1100.

The United Nations, incidentally, has been saying kind things about the publication. A letter from the European office in Geneva says "we have noted with much appreciation the interest taken by STEEL in the European iron and steel industry. We have drawn upon much information published in your magazine."

As you may know, we carry a weekly foreign news section; in this issue it begins on page 27.

Red Face Department

Our hardworking editors take great pride in the accuracy with which they report news and developments in the metalworking industry. And rightfully so, because they are harder to catch in a mistake than a bank teller. It's no wonder then that they have been scowling at us.

The reason, as you may have suspected, is that we pulled a boner in calling Hercules Powder Co. a division of DuPont, also mentioning that Hercules was offering dynamite for sale 65 years ago. Joe Dolson, industrial advertising manager of Hercules Powder Co., nicely put us straight on the facts.

The present Hercules Powder Co. wasn't organized until 1913, being formed from the old DuPont firm as a result of the antitrust decree by the United States Supreme Court. It is not connected in any way with DuPont, although the old Hercules Powder Co. was absorbed by DuPont many years before 1913. So the company advertising with us 65 years ago isn't the same as Hercules today and to all concerned we're most apologetic.

And tomorrow we have an appointment to get these darned bifocals checked.

Puzzle Corner

Answers are still pouring in to the Christmas shopping puzzle we carried Dec. 19 (the one about who's the husband of whom). Last week we had to go to press too early to list all five of the winners of prizes offered for the earliest answers. George N. Benoit of Gilbert & Barker Mfg. Co., West Springfield, Mass., was hard on the heels of W. E. Pettersen, E. G. Kobel and Eleanor J. Schatz who were the first three to submit answers. We announced these three Jan. 2. Fifth was Arthur de Vaux of Service Conveyor Co., Detroit. Mr. Benoit's answer is the most interpretive of any we've received. He says: "Arthur sleeps with Cynthia. Bernard sleeps with Barbara, and Charles is married to Ann but doesn't sleep with her because he's too cheap. Imagine giving his wife one buck to buy one present."

Many more people turned in correct answers. Sorry we haven't the space to list them all.

Here's another puzzle that should be easy. A sweeper in a shop making fasteners accidentally overturned a keg of bolts. He picked them up in two's, but found that he had one left over. Becoming interested, he overturned the keg again and picked them up in three's, but again found he had one left over. He picked them up in four's, five's and six's, but there was always one left over. Finally when he picked them up seven at a time, they came out even. How many bolts were in the keg?

Shrdlu

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STEEL

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Rapid-Responding Devices Control Seamless Tube Reheating

Production of Wire and Wire Rods—III

STEEL

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★ Denotes Regular Features

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This extreme hardness . . . at the moderate price of NI-HARD . . . provides abrasion resistance at lowest ultimate cost.

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NI-HARD develops abrasion resistance two to three times better than that of unalloyed white iron. Therefore NI-HARD can economically replace white iron.

NI-HARD lasts one and one-half to two times as long as austenitic manganese or carbon steels, under conditions involving only moderate impact. Chill cast parts are stronger and more abrasion-resistant than comparable sand castings.

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The strength and toughness of NI-HARD castings are increased fifty to eighty per cent, without loss in hardness or abrasion resistance, by a stress relieving treatment at 400-450°F. User experience has demonstrated the merit of specifying this treatment.

APPLICATIONS

Applications include: grinding balls, ball and rod mill liners, slurry pump parts, flotation impellers, piping, scoop lips, classifier shoes, roll heads, pulverizer rings, chutes and hopper liners, muller tires, plows, pug mill knives, clay augers. Also coke grizzly discs, crusher rolls, coal mine pumps, dredge pump impellers, liners, rings and sleeves. Also industrial food grinding burrs and attrition mill plates.

AVAILABILITY

Try NI-HARD wherever you encounter severe abrasion. See for yourself how its remarkable properties minimize replacements and repairs.

Authorized foundries throughout the country readily produce NI-HARD castings in all forms and shapes common to the iron and steel foundry.

INFORMATION AVAILABLE

Full information is yours for the asking. Write for the booklets, "Engineering Properties and Applications of NI-HARD", and, "Buyers Guide for NI-HARD Castings."

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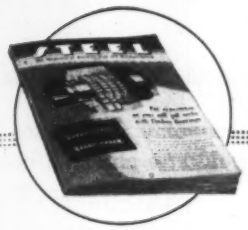


January 9, 1950

Superficial

Most noteworthy characteristic of President Truman's "State of the Union" message to Congress is its superficiality. Citizens expect their Chief Executive to present to the lawmakers a penetrating analysis of the state of affairs affecting the nation and to recommend legislation appropriate to current conditions. He did not perform either of these duties satisfactorily.

In the few paragraphs which he devoted to the "state of the union," he outlined optimistically in general terms a number of accomplishments in the domestic and foreign fields. Except for the admission that "great problems still confront us," he completely ignored such important matters as the fact that 1949 was the second worst year in labor relations in the nation's history, the confusion over pensions, and our several mistakes in foreign policy, particularly in regard to China.

As for his proposals for legislation, they are similar to those he made a year ago, with several exceptions. This year he did not ask for stand-by powers to combat inflation nor did he threaten to put government in the steel business. However, he added the controversial Brannan farm plan to his lengthy legislative program.

Most amusing sentence in the message (if its implications were not so serious) is ". . . . I am proposing that federal expenditures be held to the lowest levels consistent with our international requirements and the essential needs of economic growth and the well-being of our people." If the President really believes that the laws he proposes are "essential," then it follows that he actually is demanding a terrific increase in federal expenditures.

Mr. Truman said that if our productive power increases at the same rate as it has in the past 50 years, the national income in the year 2000 will be $1,000 billion (a trillion). Alert reporters in the Washington bureau of the "Cleveland Plain Dealer" were quick to figure that if federal taxes continue to increase as fast as in the past 50 years, the tax burden in the year 2000 will be $2,736 billion—almost three times the total national income predicted by Mr. Truman.

Perhaps this speculative comparison is as good an indicator as any of the superficiality of much that is contained in the President's message.

* * *

WHO IS KIDDING WHOM? One of the most curious documents to come out of Washington in a long time is the Fourth Annual Report to the President by the Council of Economic Advisers. Entitled "Business and Government" and signed by Leon Keyserling, acting chairman, and John D. Clark, it abounds in unexpected lavish praise for free enterprise and free government.

Most interesting is the council's analysis of eight trends which it professes to see in the government's attitude toward business. Among these is that the government realizes that "efforts to promote expansion of the total production and income of the economy are more significant than measures to redistribute the current product." Another is that government realizes more fully "that the flow of income to different parts of the economy should be viewed as an economic no less than a social problem." Another is that the government recognizes that "in a stable and expanding economy there is room both for well conducted big business (with its unique facilities for scientific and developmental experimentation) and for small business with its display of individualism and self reliance."

Most readers of the council's report will be

(OVER)

forced to conclude that Advisers Keyserling and Clark are trying hard to convince somebody that the thinking of the "government" is shifting from left toward right. Many, who would like to think this is true, probably will remain unconvinced until they see more evidence of a tangible character. —p. 17

* * *

NO TAX ON $50 BILLION: Representative Noah M. Mason of Illinois, member of the tax-originating House Ways and Means Committee, seeks to recoup the billion dollar loss in tax revenue resulting from the contemplated reduction of excises by levying on tax exempts. Income now exempt from taxation probably totals as much as $50 billion annually, which is roughly one-fifth of the total national income.

National Associated Businessmen Inc. has been studying the tax-exemption situation for months. It estimates that co-operatives, usually owned by farm and labor organizations, have an annual gross income of $17 billion. Scores of tax-paying businesses have been shifted into the tax-exempt class through acquisition by universities and colleges. Universities also buy stores and lease them back to their former owners. About 50 companies have moved to Puerto Rico to escape income taxes. Municipal purchase of transit lines and utilities constantly is reducing tax revenues.

Certainly a thorough examination of tax-exempt operations should take precedence over any attempt to increase the burden on present taxpayers. —p. 24

* * *

STEEL AND POPULATION: Steel Division of the United Nations Economic Commission for Europe sees serious over-production of steel in Europe by 1953. It estimates production for all of Europe except Russia in that year will be 70.7 million tons of ingots and castings. Domestic consumption in 1953 is figured at 58.5 million tons and maximum exports at 4.5 million tons. Thus output would exceed demand by 7.7 million tons.

Population of Europe, excluding European Russia, is about 390 million. Even after subtracting the population of the Soviet's European satellite states, there remains a population of more than 300 million, or about twice the population of the United States. Our 150 million people can consume 75 million tons or more of steel ingots annually. If Europe could moderate the intense nationalism of her peoples and in time develop a unified economy, its anticipated over-supply of steel would be changed into a sizable deficit. —p. 27

* * *

PROGRESS IN SHALE OIL: Numerous companies in the iron, steel and metalworking industries may find it advisable to keep an eye on progress in the manufacture of synthetic crude oil. The experimental plant at Rifle, Colo., operated by the Union Oil Co. for the United States Bureau of Mines, now can produce synthetic oil from shale for from $2.00 to $2.50 per barrel, which is not far out of line with the cost of natural crude in East Texas fields.

This does not mean that commercial production of shale oil is imminent. Numerous problems remain to be solved. Production of natural crude now exceeds demand and reserves are substantial. Also the cost of shale oil cited does not include a profit margin for commercial production and sale. Nevertheless it is important to know that the cost gap between synthetic and natural oil is narrowing steadily and that sometime industry may be called upon to provide facilities for producing and transporting oil derived from the shale deposits of Colorado, Wyoming and Utah. —p. 20

* * *

SURE WAY TO CUT COST: It is almost impossible to overestimate the importance of handling materials economically. In the vast industrial empire of General Motors Corp., more than 11 per cent of the hourly rated employees are charged with materials handling responsibilities.

Another measure of the size of this job is the calculation that at peak operations GM plants have a load of 43,750,000 pounds of materials and components to be moved every working day. Obviously the efficiency with which this poundage is handled has an important bearing upon manufacturing costs.

You can spend money on the most modern productive equipment and it will yield handsome dividends, provided that you also have invested wisely in the equipment necessary to keep materials flowing to and from productive units. —p. 52

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

BUSINESS AND GOVERNMENT—Although President Truman in his message to Congress was a little more kindly to business than usual, don't expect any basic change in the government attitude in 1950 (p. 17). The president reiterated most of his Fair Deal program, including requests for stiff antimerger legislation and repeal of the Taft-Hartley Law . . . The President's Council of Economic Advisers, in its annual report, seeks to quiet fears that we are heading for a socialized state. The council says it wants no "radical change" in our present system of free enterprise and free government.

BOLT PRICE CHANGES— Some members of the bolt industry are replacing their 30-year old multiple discount pricing system with a new method of single discounts. Lamson & Sessions Co. (p. 21) is one firm making the change. Under the new method separate net discounts are quoted on less case quantities, full case quantities, orders of 20,000 and 40,000 pounds. This eliminates the cumbersome chain discounts formerly quoted. The new system should help cut clerical expenses. Most consumers buying by single discount will find that the net result is higher prices, although some individual decreases have been made. Higher steel costs forced the general rise.

COST CUTTING— In 1950 you must redouble your sleuthing to find ways to cut costs (p. 18). That's the consensus of businessmen who think the coming year will be the most competitive one since the war. About the only way remaining to counteract higher costs of materials, labor, fuel and taxes is to make engineering and manufacturing economies . . . The electronics industry (p. 23) may be able to cut its costs in 1950 with a higher volume. Potential market for this type of product—mainly television sets—is tremendous.

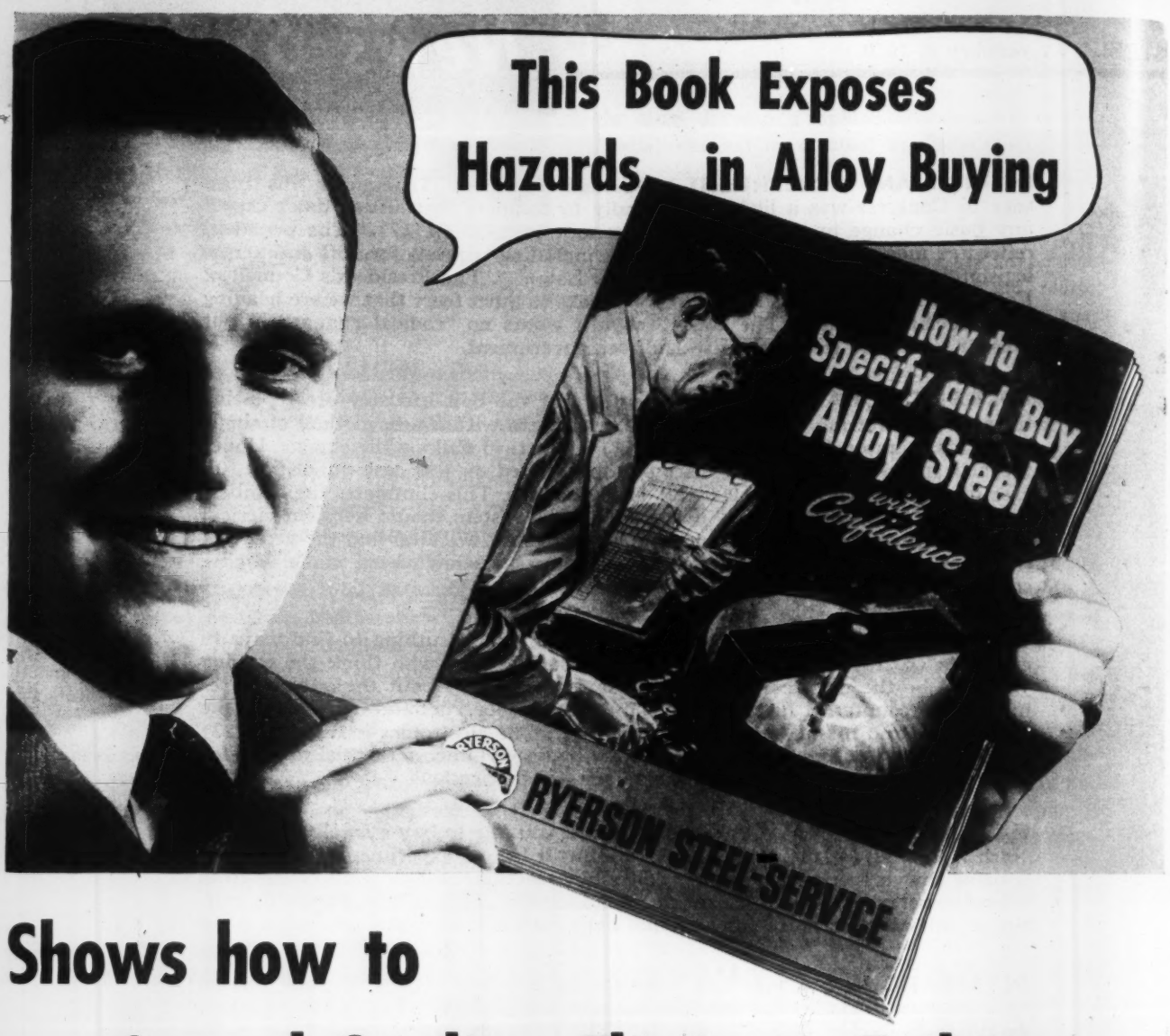
NASH EXPERIMENTAL CAR— How would you like to buy a small $1000 car? Nash is looking for the answer (pp. 19, 31). It has an experimental model that is being shown around the country for public reaction. Power would come from a low-horsepower engine of foreign manufacture. This unit is not to be confused with another, more conventional light car Nash will produce soon.

DEVALUATION— Are you still formulating a policy regarding your foreign business now that devaluation has changed the picture? Here's the situation as Black & Decker Mfg. Co. sees it. The company expects a decrease in its exports, but an increase in the volume done by English and Australian subsidiaries. Foreign plants may have to expand.

TAX LOOPHOLES— Expect a showdown in this congressional session on loopholes in income tax laws (p. 24). Rep. Noah M. Mason is leading a drive to tax the estimated $50 billion in exempt incomes being earned by labor and farm co-operatives, businesses and properties owned by educational institutions and churches.

FOREIGN STEEL—Steel production is increasing in Europe so rapidly that some 7.7 million net tons may be produced by 1953 that cannot be used (p. 27). This is caused by desires of each country to become self-sufficient in the basic metal. Economists urge a restudy of the steel investment and production programs and a closer analysis of world market conditions.

HERE AND THERE IN INDUSTRY— Minerals and metals worth $13.9 billion were produced in the U. S. in 1949 (p. 22) . . . The metal collapsible tube industry is making 40 per cent more containers now than ten years ago for your toothpaste and other products (p. 28) . . . Kaiser Steel Co. produced its millionth ton of steel ingot on Dec. 29 (p. 23) . . . Costs of producing oil from shale have been cut (p. 20) . . . LP-Gas use in 1949 increased 8.5 per cent over 1948 (p. 29) . . . Follansbee Steel Corp. sold its Toronto, O., plant and equipment to Kovalchick Industries Inc. (p. 34) . . . Respondents in the FTC steel pricing case have been invited to present their views Jan. 17 or 31 as to why their consent decree proposal should be accepted.



Shows how to Control Quality—Eliminate Failures

It's true that you may go on specifying and buying alloy steel for years without a slip. Without getting the wrong specification. Without an alloy failure.

But it's equally true that one alloy *looks* just like another and there are plenty of chances for error before an alloy steel shipment reaches you.

This book shows you how to guard against alloy errors. How to overcome the hazards caused by errors anywhere along the line. It explains the steps you can take yourself and the steps we take to protect you.

If you haven't received your copy of this helpful book, "How to Specify and Buy Alloy Steel with Confidence", we urge you to send for it today . . . and may we suggest that you call Ryerson for alloy steel of certified quality.

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STEEL
A PENTON PUBLICATION

More "Fair Deal"

Continued deficit financing, high spending, possibly more taxes in 1950 program

DON'T EXPECT any major changes in the federal administration's attitude toward business this year. Be prepared for further deficit financing, for continued high-level spending at home and abroad and for burdensome taxes. If President Truman has his way, your taxes may be even greater.

The federal budget asked for fiscal 1951 will be about $42 billion, slightly less than expenditures in the current fiscal year, but still about $4 billion more than estimated receipts.

But if Congress should authorize all that the President is proposing in the way of a welfare state, federal expenditures would soar far above the budget figure mentioned. Just how far no one knows. Nor are they likely to find out. Congress is in no mood to grant all Mr. Truman wants.

Same Program as in 1949—The President's State of the Union message to Congress reveals a program that is virtually a carbon copy of the 1949 program.

This year he is not threatening to put the government in business, if private industry does not expand fast enough to suit the administration.

Nor is he asking for anti-inflation controls. Nor does he put a specific figure on the tax increase he thinks is necessary.

But practically all the remainder of the "fair deal" is in the program for 1950: Taft-Hartley repeal; liberalization of Social Security; medical insurance; federal housing; farm prices supports under the Brannan plan; continuation of foreign aid through support of the Atlantic defense plans, funds for the European Recovery Plan and implementation of the "Point Four" program to aid underdeveloped countries; increased unemployment compensation; and stricter antitrust legislation to prevent "monopolistic" mergers.

Asks Tax Increase—Mr. Truman says he will seek tax changes to provide a "moderate" increase in federal revenues. While these will not be spelled out until he sends a special revenue message to Congress, Washington observers say he will suggest cutting excise taxes by about $1 billion and substituting increases in levies on corporations and high-bracket individual incomes. Meanwhile Congress is eyeing certain tax-exempt income and may move to put levies on farm and labor union co-operatives, universities operating businesses and to close other loop-holes in the revenue laws (see p. 24).

Although the President asserts he will try to hold federal spending to the "lowest levels consistent with our international requirements and the essential needs of economic growth and the well being of our people," no retrenchments are yet suggested by the administration.

Powerful congressional leaders profess readiness to make a determined fight on extravagant federal spending. When the President in his State of the Union message referred to holding expenditures down, he was drowned out by applause from all sections of the chamber. Said Mr. Truman: "I think I had better read that over."

Bids for Small Business Support—In a studied attempt to placate business, Mr. Truman is not saying anything about the government getting into the business act.

He promises a series of proposals to strengthen the antimonopoly laws, to assist small business and to encourage the growth of new enterprises.

By way of encouragement, the President does a little mid-century soothsaying. By the year 2000, national production should be four times as great as last year and average family income should be tripled.

PRESIDENT TRUMAN
. . . I'd better read that again

Foes Cry "Socialism"—Republicans and some Democrats attack the President's program as a blueprint for a "handout" government and a socialistic state. Some congressmen jibed that the State of the Union message was mislabeled and that it should have been called the "message on the state of Socialism."

But from his Council of Economic Advisers comes an annual report to the President professing strong admiration for free enterprise.

Business and Government

President's economic advisers profess admiration for, would nourish free enterprise

ARE YOU one of the many Americans who fear business and enterprise are being hamstrung or killed off by growth of government?

If you are, you are perturbed unnecessarily. At least that is what the Council of Economic Advisers says in a report to the President.

Signed by Leon Keyserling, acting chairman, and John D. Clark, the report professes an admiration for our form of government and a disdain for other types. Noting current efforts "by other peoples with a long tradition of democracy to combine free government with very substantial diminution of free enterprise," the council says "in our view these other free peoples will approach their own special problems according to their own needs or beliefs; but our problems are not theirs and we have different methods which are our own.

Want No Radical Change — "Although many of our problems remain unsolved," the council comments, "our unique combination of free enterprise and free government has moved so rapidly toward raising the general standard of living that the fair hope of more progress by the same methods immensely outweighs the costs and risks, the divisions and tensions, and above all the uncertainties, of radical change."

Freedom, the report suggests, hinges on moderation in contrast with radical action on any needed change.

From its strategic point of observation the council sees eight trends in the attitude of government toward business:

1. **Discard** of the theory that stagnation of business is inevitable, and replacement of it with firm conviction that our business system and

our whole economy can and should continue to grow.

2. **Realization** that efforts to promote expansion of the total production and income of the economy are more significant than measures to "redistribute" the current product. Here the council says "the notable expansion in production which our economy has achieved in the past and can certainly repeat or excel in the future, coupled with the observed fact that this lifts the general standard of living, should receive foremost consideration in economic programs and policies."

3. **Fuller** realization that the flow of income to different parts of the economy should be viewed as an economic no less than a social problem. The council suggests an approach that "should be used to evaluate those government programs which channel the flow of income from one spot in the economy to another, to test whether these programs promote general stability and expansion or rob Peter to pay Paul."

4. **Belief** that government should stimulate thinking and analysis by business and other elements in our free enterprise system that will help them to advance the general economic welfare and thus reduce requirements for public supplementation.

5. **Belief** that the government's antitrust policy should continue but recognition that "in a stable and expanding economy there is room both for well conducted big business (with its unique facilities for scientific and developmental experimentation) and for small business with its display of individualism and self reliance." Small business, says the council, has some unique problems of obtaining financing, and more efforts should be directed toward solving them.

6. **Movement** of government away from purely negative or policing function and toward the affirmative or facilitative approach. Regulation, the council points out, is inadequate to correct an economic situation in which business might not receive the incentives to stimulate a high enough level of investment.

7. **Departure** from specific controls. It is important, the council asserts, to realize that controls do not for the long pull answer the basic economic questions confronting the American economic system. The answer, the council states, resides in improved economic understanding rather than in fiat. "The government," the council observes, "should use its fiscal and monetary powers to promote economic balance," and the "continuing adjustment of prices and wages and profits should be left to the actions of managers and workers within our business system."

LEON KEYSERLING
. . . freedom through moderation

8. **Movement** away from theory that only government action can iron out fluctuations in the business cycle and placing of increased reliance on private enterprise to minimize such fluctuations.

1950: Cost-Cutting Year

Metalworking executives seek means to keep sales climbing in more level market

A SMALL boy once took 40 minutes of strenuous effort to go up a "down" escalator in a department store.

Most of industry since the war has been comfortably riding the "up" economic stairway. How can business continue to go up if it finds itself on the "down" escalator in 1950? Businessmen agree that strenuous efforts to meet competition could turn the trick. More cost-cutting and greater sales efforts may provide the answer to static or declining sales in the months ahead.

Engineer Out Labor Content — "Lowering of manufacturing costs—perhaps by engineering out some of the labor content of fabricated goods—and development of new products with new utility may be industry's best bet to counteract surfeited demand for present products," says Frank A. Hiter, senior vice president of Stewart-Warner Corp.

He says: "We have turned to inventive and design skills—engineering—and to technological skills—manufacturing—as about the only areas to which we can look to counteract" higher costs of materials, labor, fuel and taxes. This year Stewart-Warner will be introducing new lubrication, pumping and automotive heating equipment designed for economy in materials and labor content. The increased sales volume will more than offset any reductions in labor content, so aggregrate manhours won't diminish.

Greater Sales Efforts—A survey by the Manufacturers Association of Syracuse reveals that many metalworking companies in that area of New York are increasing appropriations for advertising and sales promotion to better their positions in a keenly competitive market.

Most companies surveyed revealed they are studying ways to increase productivity to offset the high cost of labor.

Producers of capital equipment in Syracuse expect a good year because industry can't afford not to have the most efficient production machinery.

Company Profits Increase

Profits after taxes of U. S. manufacturing corporations for the third quarter of 1949 increased about $300 million, or 15 per cent, above those for the second quarter. That is in spite of a relatively small increase in the volume of sales, says the Securities & Exchange Commission and the Federal Trade Commission which made their joint quarterly report.

Profits after taxes increased from $2 billion in the second quarter to $2.3 billion in the third. But third quarter profits were still 20 per cent lower than for the corresponding quarter of 1948.

Corporations in all size groups showed profit increases in the third quarter. Smaller firms had higher percentage increases than larger. The best improvement in the period was made by companies manufacturing leather and leather products, apparel and finished textiles and fabricated metal products. Those groups raised their third quarter profits 50 per cent or more over the second quarter. Four other industries—chemicals, motor vehicles and parts, primary nonferrous metals and textile mill products—showed an improvement of 35 per cent or more.

Profits of manufacturing corporations as a whole amounted to 6 cents per dollar of sales, compared with 5.2 cents for the preceding quarter. Dividends paid in the third quarter amounted to about $870 million and were about 11 per cent less than the amount paid in the third quarter of last year. Total assets of manufac-

turing corporations increased from $109 billion to $110.1 billion in the third quarter.

Credit in 1949 Tops $18 Billion

Consumer credit—it reached an all-time high of $17,823 million in November—probably exceeded $18 billion for 1949.

Installment debt also hit a new high in November, at $10,450 million, and the Federal Reserve Board noted a jump of $257 million in charge account volume. That always climbs during the holiday buying season.

Manufacturers' Sales Hold

Manufacturers' sales in November were $18.2 billion, about equal to those of October, says the Office of Business Economics, Department of Commerce.

Sales held up better than usual at that time of the year and, after allowance for seasonal variations, were 7 per cent above the October rate. The value of new orders received by manufacturers dropped slightly below the October rate. Inventory book values remained relatively unchanged over the month.

Sales of durable goods manufacturers rose to $7.4 billion from $7 billion in October. End of steel and coal strikes boosted factory activity more than 10 per cent on a seasonally adjusted basis. The metalproducing industries were the chief contributors to the rise.

The value of total inventories held by manufacturers at the end of November was estimated at $30.8 billion or $100 million more than in the previous month. The rise is accounted for largely by nondurable goods industries. Liquidation of inventories continued among the durable goods industries. Goods on hand at the end of November were valued at $13.6 billion or $200 million under the October figure.

Rural Power Distribution Up

Power systems financed by the Rural Electrification Administration distributed 30 per cent more power in 1949 than in 1948. There was a 21 per cent increase in consumers served. The gains were the largest yet recorded for any year of the program.

With 78.2 per cent of the country's farms electrified, use of power is moving beyond the initial stage of lighting and home convenience, to place the emphasis on those devices that contribute to farm income. Energy sold by REA borrowers jumped from 4757.1 million kwhr in 1948 to 6199 million kwhr in 1949. REA borrowers have 933 locally owned power systems in operation. They serve 3,044,000 rural consumers over 934,000 miles of line. Systems in service increased over 1948 by 41, consumers by 526,000 and miles of line by 175,000.

During the year, REA loans approved total $1996 million, an increase of $421 million in 1949. Of the loans approved, $1432.5 million has been advanced to borrowers.

RFC Halts Lustron Loans

Reconstruction Finance Corp. has halted its loans to Lustron Corp., Columbus, O.

The builder of prefabricated steel houses has not been meeting its payments on loans already made, although it has kept interest on the loans paid in full. Carl G. Strandlund, president, told the House of Representatives Banking Committee last summer that about $20 million of Lustron's debt was due before Dec. 1. In the past two months Lustron, with RFC funds cut off, has been meeting operating expenses by converting much of its big stock of materials into prefabricated houses and selling them at a loss.

The company hopes this expedient will keep it afloat until it can complete a reorganization. (For another detail about Lustron please turn to p. 35.)

Home Building Costs To Rise

Home building costs in California are likely to increase in 1950, the Home Builders Council of California believes. The chief factor, the council says, is the widespread increase in steel prices.

Other factors entering into the probable housing cost rise are cited as increases in such items as cast iron soil pipe, lumber and cement.

In spite of the cost prospect, indications point to a high level of home building in California this year. Housing construction, after dipping last spring, gained momentum late in the year and was running at record levels in November and December.

Reaction, Please: $1,000 Automobile

HOW ABOUT YOU? Nash Motors would like to know how a quarter of a million selected American people feel about buying a convertible like this: 84-inch wheelbase, 47-inch tread, powered by either an 18 or 36-hp foreign built four-cylinder engine and priced at less than $1000.

No plans have been formulated yet for manufacturing the car; none will be until the public's verdict is known. After it is known, it would probably take a year to have plants ready and contracts placed for parts.

The idea of using a foreign engine —perhaps foreign axles and transmissions—is to help relieve dollar shortages in Europe and to avoid the cost incident to development and tooling of small engines. After all, the accent this year is on economy and competition.

Called tentatively the N. X. I. (Nash - Experimental - International), the car should not be confused with a new small model that Nash will introduce shortly to round out its present line of passenger cars.

Devaluation Hits Exports

Black & Decker may enlarge foreign plants in bid for larger share of overseas trade

EFFECTS of foreign currency devaluation are reflected in the thinking, planning, and earnings of the tool producer, Black & Decker Mfg. Co., Towson, Md.

The company expects a decrease in export business from its Maryland plant but anticipates its English and Australian subsidiaries will experience a corresponding increase that may make it necessary to enlarge facilities of those foreign plants. The English and Australian subsidiaries, the company observes, are in a favorable position of offering equivalent products for English or Australian pounds to customers who find it expensive to pay U. S. dollars for U. S.-made products.

Confident of Domestic Market — The company holds little fear that foreign goods prices lowered by devaluation will cut into its sales in the United States. "Doubtless, some foreign competitors will take advantage of this situation to increase their sales in the United States and Canada, but the firmly entrenched reputation of our products, the superior channels of distribution, built carefully over the years, and the outstanding convenience of factory service from our nationwide network of 25 service branches are competitive advantages which newcomers to our U. S. markets cannot match overnight," the company declares.

Writes Down Foreign Holdings — In recognition of devaluation, Black & Decker in its consolidated statement for the fiscal year ended Sept. 30, 1949, makes a considerable downward adjustment of the values of the properties and other assets and liabilities of its foreign subsidiaries. This adjustment in terms of U. S. dollars amounted to $701,954.80. In deducting this amount, the company's 1949 earnings after taxes were cut from $2,327,948.76 to $1,625,993.96.

The company points out it will sustain a loss each time dividends are paid to the parent company by the foreign subsidiaries. The money actually received will be worth less when exchanged for U. S. dollars, although the amount of loss will be only a small percentage of the total values involved, the company explains.

Brisk Foreign Business for Joy

Promising prospects for business overseas this year are seen by Joy Mfg. Co., Pittsburgh.

Commenting on the outlook, J. D. A. Morrow, president, who with E. M. Platts, general sales vice president, visited Europe recently, reports arrangements were made to coordinate effectively the sales of the parent company with the manufacturing programs and sales of its wholly owned overseas subsidiaries. Mr. Morrow and Mr. Platts conferred in Europe with the heads of Joy's British, French, Belgian, South African and Australian companies.

Customers, says Mr. Morrow, will be supplied Joy machines that they desire with either British or American electrical equipment, and quotations will be based on the best proposal that can be made, considering the currency the prospective customer may have available.

In reviewing 1949, Mr. Morrow reports the company's business not dependent on coal mining was generally well maintained. Several domestic lines and its export total showed gratifying increases for the year, he points out. Largely reflecting the disturbing conditions in the coal mining industry, Joy's net income for the fiscal year ended Sept. 30, 1949, dropped to $3,890,813 from the $6,958,925 of the year ended Sept. 30, 1948. This decline led the company's directors in November, 1949, to reduce the quarterly dividend and omit any yearend extra dividend.

Shale Oil Costs Cut

SUPPLIERS of oil country equipment are pondering the rapid progress being made in manufacture of synthetic crude. Announcement that the government's experimental plant at Rifle, Colo., has succeeded in cutting the cost of processing shale oil to virtually that of commercial production has raised the possibility of vast changes in the market for oil field goods.

Operated by Union Oil Co. for the U.S. Bureau of Mines, the Colorado experimental plant has been conducting extensive process and cost tests. It can now produce synthetic oil from shale for $2.00 to $2.50 per barrel, which approximates the cost in East Texas oil fields. Shale rock contains on the average 25 to 30 gallons of oil per ton.

There are, of course, major difficulties. The costs now cited apparently do not include a profit margin for commercial production. Heavy expenses would be involved in transporting the finished product from the presently known Colorado, Wyoming, and Utah shale deposits. The development comes in the face of current overproduction of crude oil and the existence of vast underground reserves.

But far-sighted observers in the oil industry and among its suppliers point to the day when synthetic oil will be in commercial production and will be able to compete with petroleum. They emphasize the importance of synthetic oil's potential to the steel and metalworking industries in terms of plant, equipment, tanks, and pipelines.

Cue to No Queuing

INDUSTRIAL Cost-Cutting Exposition, sponsored by the American Society of Tool Engineers in Philadelphia, Apr. 10-14, already is approaching a sellout: 267 companies are accounting for 86 per cent of the space.

Executive Secretary Harry E. Conrad says 1950 promises to be an excellent year for sale of cost-cutting equipment based on a "projected purchases" survey.

Those planning to attend the show can arrange for registration in advance. So if you don't want to wait in line in Philadelphia, write the society at 550 W. Lafayette Blvd., Detroit 26.

Cheaper To Buy Steel

WICKWIRE Brothers Inc. has closed its open hearth and blooming mills in its Cortland, N. Y., plant because of continually rising operating costs. The company will buy its steel from other companies in the future.

Barium Buys Blast Furnace

BARIUM Steel Corp. has purchased the Chester, Pa., blast furnace of Allied Iron Works Inc. although physical possession may not be taken for several months.

The furnace has maximum daily capacity of over 500 tons. During the war the government spent $1.8 million on improvements to the unit. In the postwar steel shortage, Standard Oil Co. of Indiana and Brown Engineering Co. of Texas formed the Allied company to operate it as a source of iron for conversion into pipe.

Allied spent an estimated $4 million on additional improvements, made by H. A. Brassert & Co. Before this program was completed, the steel shortage eased. So far as is known, none of the iron produced ever went into pipe. The furnace has been idle for nearly a year, although well maintained.

Barium will use the plant primarily as a standby unit.

Bolt Prices Overhauled

Lamson & Sessions revises discounts. Reflects changes in steel prices and bolt manufacturing

RADICAL change in pricing bolts and nuts has been effected by the Lamson & Sessions Co., Cleveland. New discount schedules covering carriage, machine and lag bolts, cold-punched, hot-pressed and semifinished nuts and cap screws went into effect Jan 3. They represent the most thorough overhauling of pricing practice in the industry in years.

New discounts announced by Lamson & Sessions are listed in the table at bottom of this page.

Some Up, Some Down—Both increases and some decreases in prices result from the change, though, overall, the net result is an increase reflecting higher steel costs ranging up to 27 per cent in some instances. Increases are not uniform due to the effect of irregular steel prices and labor costs. Bolts ½ x 6 inches and smaller for instance were increased approximately 10 per cent. Increases throughout the list range upward and downward depending on the product, amount of steel involved and manufacturing methods.

Under the new method separate net discounts now are quoted on less case quantities, full case quantities, orders of 20,000 lb and 40,000 lb. This eliminates chain discounts formerly quoted and which represented additions to the base discount. Considerable simplification results with each quantity standing on its own.

Reflects New Boltmaking Practices—The new schedule of discounts not only reflects higher steel costs but is predicated on advances in manufacturing practice accompanying installation of new and modern boltmaking equipment. Increased truck movement of bolts and nuts in certain areas also was a factor, especially in pricing on orders and shipments of 20,000 lb.

Heavier movement of bolts and nuts by truck reflects changes in shipping necessitated by governmental opposition to use of basing point pricing. Formerly many producers of bolts, nuts and rivets sold their products on a basing point system but for the last year or so many have sold f.o.b. factory, in some cases equalizing freight. In Lamson & Sessions' new schedule delivery terms on hot-pressed and cold-punched nuts, carriage and machine bolts specify f.o.b. the seller's plants. In the case of semifinished nuts delivery terms call for f.o.b. seller's plants with actual freight allowed on shipments of 200 pounds or over, not to exceed 65 cents per 100 pounds. Bulk shipments of cap and set screws also provide for some freight allowance.

FACTS AND FIGURES

REPRINTS of Metalworking Facts and Figures, statistical section in the 1950 Metalworking Yearbook issue of STEEL, are being made available to subscribers. This 32-page booklet contains all pertinent data for the metalworking industries. Single copies are gratis. Prices for larger quantities on request. Write to Readers Service Department, STEEL, 1213 West Third St., Cleveland 13, Ohio.

	Base Disc., less than full cases %	Disc., full cases %	Disc., 20,000 lb orders* %	Disc., 40,000 lb orders* %
BOLTS—Carriage and machine.				
½ in. & smaller x 6 in. & shorter	27	38	40	42
⅝ in. & ¾ in. x 6 in. & shorter	29	40	42	44
⅞ in. & larger x 6 in. & shorter	26	37	39	41
All diameters longer than 6 in.	22	34	36	38
Lag, all diams. x 6 in. & shorter	30	41	43	45
All diams. over 6 in. long	28	39	41	43
Ribbed neck carriage	26	37	39	41
Blank	40	None	42	44
Plow	40	None	42	44
Step, elevator, tap, sleigh shoe	28	None	30	32
Tire bolts	20	None	22	24
Boiler and fitting-up bolts	37	None	39	41
Dardelet rivet-bolts	Price schedule on request			
Weather-tight	Price schedule on request			
Key bolts	Price schedule on request			
RIVETS—⅛ in. & smaller	Price schedule on request			

Terms of delivery and payment on bolts and rivets: F.o.b. seller's factory, Cleveland, Chicago, Birmingham, 30 days net, 1 per cent cash discount for payment within 10 days from date of invoice.

*Discount applies to full case quantities for bolts. For broken case quantities add 15 per cent.

	Base Disc., less than full cases %	Disc., full cases %	Disc., 20,000 lb orders† %	Disc., 40,000 lb orders† %
NUTS—H.P. & C.P. regular and heavy square.				
½ in. & smaller	25	37	38½	40
⅝ in. & ¾ in.	23	35	36½	38
⅞ in. through 1½ in.	23	35	36½	38
1⅝ in. & larger	16	29	30½	32
NUTS—H.P. regular hexagon.				
½ in. & smaller	33	43	44½	46
⅝ in. & ¾ in.	28	39	40½	42
⅞ in. through 1½ in.	25	37	38½	40
1⅝ in. & larger	17	30	31½	33
NUTS—H.P. heavy hexagon.				
½ in. & smaller	29	40	41½	43
⅝ in. & ¾ in.	25	37	38½	40
⅞ in. through 1½ in.	23	35	36½	38
1⅝ in. & larger	16	29	30½	32
NUTS—C.P. regular hexagon.				
½ in. & smaller	33	43	44½	46
⅝ in. & ¾ in.	30	41	42½	44
⅞ in. through 1½ in.	27	38	39½	41
1⅝ in. & larger	20	32	33½	35
NUTS—C.P. heavy hexagon.				
½ in. & smaller	29	40	41½	43
⅝ in. & ¾ in.	27	38	39½	41
⅞ in. through 1½ in.	24	36	37½	39
1⅝ in. & larger	17	30	31½	33

Terms of delivery and payment for H.P. and C.P. nuts: F.o.b. seller's factory, Cleveland, Kent, O., Chicago, Birmingham, 30 days net, 1 per cent cash discount for payment within 10 days from date of invoice.

†Discount applies to full case quantities for nuts. For broken case quantities add 15 per cent.

	Base Disc. from bulk list for less than case or keg quantities %	Allowance for full case or keg quantities %
SEMIFINISHED NUTS—Regular.		
½ in. & smaller	41	50
⅝ in. & ¾ in.	36	46
⅞ in. through 1½ in.	31	42
1⅝ in. & larger	21	33
SEMIFINISHED NUTS—Heavy.		
½ in. & smaller	35	45
⅝ in. & ¾ in.	30	41
⅞ in. through 1½ in.	27	38
1⅝ in. & larger	17	30
SEMIFINISHED NUTS—Light.		
½ in. & smaller	41	50
⅝ in. & ¾ in.	36	46
⅞ in. through 1½ in.	33	43

Terms of delivery and payment for semifinished nuts: F.o.b. seller's factory, Cleveland, Kent, O., or Chicago, with actual rail and water freight allowed on shipments of 200 lb or over, not to exceed 65 cents per 100 lb. 30 days net, 1 per cent cash discount for payment within 10 days from date of invoice.

	Discount, 1020 Steel Bright		Discount, 1035 Steel Heat Treated	
	Pkg. %	Bulk # %	Pkg. %	Bulk # %
CAP SCREWS—Hexagon head, coarse or fine thread, 6 in. or shorter.				
¼ in. through ⅝ in. diam.	50	60	42	54
¾ in. through 1 in. diam.	43	55	37	49
CAP SCREWS—Hexagon head, coarse or fine thread, longer than 6 in.				
¼ in. through ⅝ in. diam.	33	47	11	29
¾ in. through 1 in. diam.	13	31	11	29

	Discount	
	Pkg. %	Bulk # %
CAP SCREWS—Fillister head, coarse thread	21	43
CAP SCREWS—Flat head, coarse thread	List	24
SET SCREWS—Square head, cup point, coarse thread.		
1 in. x 6 in. & smaller	46	59
Longer than 6 in., up to & including 1 in. diam.	33	46
SET SCREWS—Headless, cup point, coarse thread.		
No. 10 & smaller	41	On request
¼ in. diam. & larger	24	On request
N.F. thread, all diameters	18	On request

Terms of delivery and payment for cap and set screws: F.o.b. seller's factory, Cleveland, Birmingham, or Chicago, with actual tariff rate of rail, or rail and water freight allowed on shipments of 200 lb or over, not to exceed 65 cents per 100 lb. 30 days net, 1 per cent cash discount for payment within 10 days from date of invoice.

Prices apply to bulk quantities of cap and set screws of one diameter and length, as follows, for one shipment from factory: ¼ in. through ⅝ in. diam., 15,000 pieces. ⅞ in. through ⅝ in. diam., 5000 pieces. ¾ in. through 1 in. diam., 2000 pieces.

	Discount, %
STUDS—Milled, listed sizes, packages	28

Mine Output Drops

But 1949 minerals and metals at $13.9 billion have second largest value in history

MINERALS and metals worth $13.9 billion were produced in the United States in 1949, says Interior Secretary Oscar L. Chapman. Although this value was 11 per cent less than in 1948, it was the second greatest in history.

The huge mineral value reflects a general continuation of high unit prices but also a mine tonnage unsurpassed in any war or prewar year. As a group, mineral fuels decreased 12 per cent in value in 1949 because of the general industrial decline, work stoppages in coal and a shift in the foreign trade balance. Yet the volume of natural gas piped hit an alltime high. Decreased oil output reversed a six-year upward trend.

Nonmetallics, valued at $10.9 billion for the year, is the only major mineral group that in 1949 equaled the 1948 production high.

Metals, valued at $3 billion for the year, dropped 15 per cent in dollar output in 1949 because of steel and smelter strikes and the break in prices of base metals.

Iron Ore—The steel strike forced virtual closing of Great Lakes shipping on Oct. 1 and caused an estimated 16 per cent drop in iron mine shipments in 1949. Iron ore prices were about 17 per cent above the 1948 level.

Ferroalloy Metals—Shipments of ferroalloys slumped 29 per cent from 1948. This was due partly to the general decline in production of steel ingot, but also to a more drastic curtailment of demand for alloy steel. Mine shipments of manganese, tungsten and molybdenum ores and concentrates decreased 12, 28 and 22 per cent, respectively.

Copper, Zinc and Lead — Copper smelter output dropped during the second quarter of 1949. Some recovery came by yearend but not to the March-April production level because there was no general resumption of the six-day work schedule. Mine production of copper was 11 per cent lower than in 1948. The strike at the Bingham Canyon, Utah, copper mine cut production from Oct. 24, 1948, through February, 1949. The sharp break in zinc prices interrupted some operations. The 3 per cent increase in lead mine output, greatest since 1944, reflected the incentive of earlier higher prices and also fewer interruptions in operations from strikes.

Light Metals—Mining of domestic bauxite declined 25 per cent in 1949. Production of aluminum during each of the first seven months of 1949 exceeded output of the corresponding months of 1948, but strikes at reduction plants curtailed operations from August to December. Demand for primary magnesium increased substantially; fabricating costs were reduced. Notable progress was made in 1949 in the commercial development of titanium metal and alloys.

Gold and Silver—The slightly lower mine production of gold was principally in the by-product segment of the industry and attributable to lower prices for base metals. The major cause of the 11 per cent decrease in mine output of silver was a strike at the Bunker Hill & Sullivan smelter, Idaho, which serves several of the country's leading argentiferous lead mines.

Other Metals—Mercury mining was at such a low ebb in early 1949 that output for the year is expected to be the smallest in a century of record-keeping. The sustained demand for pigments led to another record in shipments of titanium concentrates. Cadmium metal refining in 1949 was at a peacetime high.

Bituminous Coal — Production of bituminous coal and lignite in 1949 is estimated at 430 million tons, a decrease of 28 per cent from 1948.

OBITUARIES...

William E. Brewster, 60, who retired a year ago as manager of operations, **Wisconsin Steel Division,** International Harvester Co., Chicago, died Dec. 19. He had recently returned from Europe where he was special technical consultant on steel plant operations for the U. S. Military Government in Austria. Mr. Brewster started his association with Wisconsin Steel Works in 1910.

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Charles O. Drayton, 58, vice president and sales manager, **American Screw Co.,** Providence, R. I., died Dec. 19. A past president of the U. S. Wood Screw Bureau, Mr. Drayton had also served as secretary-treasurer of the Export Screw Association.

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Harold J. Deutsch, 60, vice president and director, **Monarch Aluminum Mfg. Co.,** Cleveland, died Dec. 24. He had served as vice president since shortly after the company's incorporation under the present name and was active in its management for 36 years. In 1913 Mr. Deutsch and his brother, Raymond Deutsch, founded the company under the name of Monarch Aluminum Ware Co.

R. Edson Emery, identified for almost half a century with the steel industry in western Pennsylvania, died Dec. 29. He started to work for Crucible Steel Co. of America in 1902, leaving in 1921 to become president of Superior Steel Co. In 1926 he assumed presidency of Colonial Steel Co. and left that company to become president of **Jessop Steel Co.** in 1929. He retired from Jessop Steel Co. in 1946 and was serving as chairman of the board at time of his retirement.

—o—

Clifford D. Prickett, 86, former vice president and director, **Hercules Powder Co.,** died Dec. 29 at his home in Wilmington, Del. He helped to organize the company in 1912 and became assistant general manager in charge of black powder operation. In 1930 he marked 50 years with the company. He retired 11 years later.

—o—

Robert Stewart, 72, former general superintendent, **Bagley & Sewall Co.,** machine shop, Watertown, N. Y., died Dec. 29. He was associated with the company for 41 years until his retirement.

—o—

J. A. Schallenberg, assistant comptroller, **Worthington Pump & Machinery Corp.,** Harrison, N. J., died Dec. 16.

—o—

B. Franklin Bales, 37, sales manager, **Shakeproof Inc.,** Chicago, died Dec. 21.

—o—

John F. Lane, secretary and treasurer, **Pullman Inc.,** Chicago, died Dec. 20.

—o—

Edgar C. Sanders, 50, vice president, **American Foundry & Mfg. Co.,** St. Louis, died Dec. 18.

—o—

Samuel S. Eckstein, 49, purchasing agent for the body division of **Nash-Kelvinator Corp.** in Milwaukee, died Dec. 22.

—o—

Clarence A. Raftrey, 52, works manager, **Cadillac Division,** General Motors Corp., died Dec. 31.

—o—

John B. Milliken, 80, former treasurer and director, **Yale & Towne Mfg. Co.,** Stamford, Conn., died Dec. 30. He retired in 1920.

—o—

F. Carroll Taylor, 65, general counsel and a director, **Yale & Towne Mfg. Co.,** Stamford, Conn., died Dec. 24.

Electronics' Big Year

Television, radar and radio to combine to establish new sales records in 1950

THE ELECTRONICS industry, spurred on by the potential for television and encouraged by a good market for radio and radio-phonographs, will set new sales records in 1950, says Dr. W. R. G. Baker, vice president of General Electric Co.'s Electronics Department. He gave this estimate in response to a survey by the Manufacturers Association of Syracuse, N. Y.

Television—The public will spend over $800 million for TV receivers in 1950, plus $60 million for installations. To meet this demand, the industry hopes to produce 3.5 million receivers, a 30 per cent increase over 1949. By the end of 1950, television programs will be available to 65 per cent of the American people.

Radio and Phonographs — The strength of consumer demand for small radios and radio-phonograph combinations in the last quarter of 1949 surprised the industry. On the strength of that performance, it believes more than 9 million radio sets of all types will be sold, with a retail value in excess of $350 million. There are countless communities that cannot expect television next year—or in the foreseeable future—with whom radio must remain the major exclusive service.

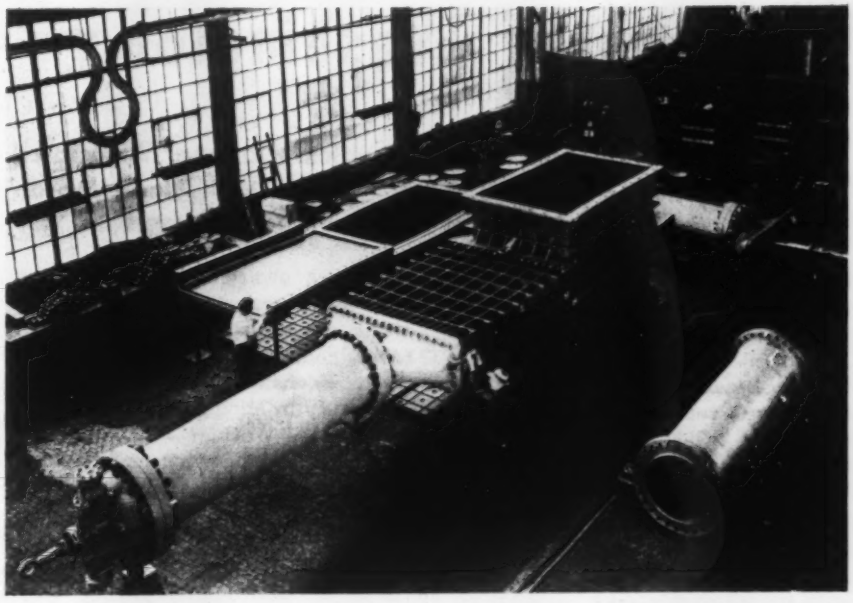
Tubes—The 1950 market for radio and television receiving tubes of all types is estimated at $175 million, at the manufacturers' level. The industry will make about 190 million tubes for these applications. This includes about 4 million picture tubes for initial equipment, replacement business and inventory, and 186 million other types. The market for transmitting and associated tubes is estimated at $25 million, and at $10 million for industrial tubes, at manufacturers' level.

Two-Way Radio—In other fields of electronic activity, two-way, land-mobile radio communications have grown into a sizable business. The market in 1950 is estimated at $25 million. Police departments will spend $5.5 million for this equipment; public and Rural Electrification Administration utilities $6.7 million; taxicab companies $2,250,000; and forest conservation agencies $1,025,000. The petroleum and heavy construction industries, highway maintenance and fire departments, lumber organizations and others will round out the additional orders for the year.

Radar — Primary use for commercial radar in 1949 continued to be in marine applications. About 1000 licenses have been granted by FCC since the war for radar on all types of vessels from ocean-going liners to inland craft. At the present rate of growth, 340 vessels will obtain licenses to operate radar in 1950.

General Electric started production in 1949 on 27 airport surveillance radar systems for the Civil Aeronautics Administration. First installation is expected in the second half of 1950 and several more will be made before the end of the year. These devices can give traffic controllers a complete picture of all airplanes within 30 miles, regardless of the weather.

Government Business—The government market for electronics equipment in 1950 is estimated at $300 million. The nature of most of this equipment is confidential.



FOR PENNSYLVANIA FLOOD CONTROL: Twenty-six of these 35-ton gates for the Conemaugh Dam in western Pennsylvania are being made at the Metal Products Division of Koppers Co. Inc. in Baltimore. On the assembly aisle are a gate complete with bonnet and lifting cylinder (center), one of the gates partially assembled (left), a cylinder alone (right), and a completed cylinder assembly (background). All 26 gates will be completed this year at a cost of $1,237,000

Kaiser Sets Production Records

KAISER Steel Corp. on Dec. 29 poured its millionth ton of steel ingot for the calendar year 1949, marking the first time any West Coast steel producer has achieved the million-ton mark in a single year.

The Fontana mill now has a capacity of 1,130,000 tons of ingots a year. The company in October added a second blast furnace, increasing the pig iron potential, and early this year, probably in March, it will broaden its finishing mill capacity with operation of a new hot-rolled strip mill and a new electric weld pipe mill.

Another Kaiser company, Kaiser Aluminum & Chemical Corp., produced approximately 250 million pounds of primary aluminum in 1949.

Tests Show Ore Stores in North

THE DRILLING program at the Quebec-Labrador iron ore concessions has verified the existence of 355 million tons, with much of the areas still to be explored.

This was announced at the first meeting of the full board of directors of the Iron Ore Company of Canada, held in Cleveland. The company was formed to finance development of the Canadian deposits.

Directors of the company were announced as follows: C. M. White and W. W. Hancock, Republic Steel Corp.; A. J. McFarland and W. W. Holloway, Wheeling Steel Corp.; Frank Purnell and J. L. Mauthe, Youngstown Sheet and Tube Co.; Ernest T. Weir, National Steel Corp.; Charles R. Hook and W. W. Sebald, Armco Steel Corp.; G. M. Humphrey, M. A. Hanna Co.; J. H. Thompson, Hanna Coal and Ore Corp.; Jules R. Timmins, Hollinger Consolidated Gold Mines; J. I. Rankin, N. A. Timmins and Co.; J. H. C. Waite, Mining Corp. of Canada, and J. Y. Murdoch, Noranda Mines.

Officers are G. M. Humphrey, president; Jules R. Timmins, vice president; J. H. Thompson vice president; C. N. Osborne, treasurer, and G. W. Humphrey, secretary.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Tax exemption has a lot of angles. National Associated Businessmen points out a good many. Rep. Noah Mason looms as leader of the revolt against tax exempts

WHEN House and Senate convened last Tuesday for the second session, 81st Congress—in gleaming chambers completely rebuilt and renovated at a cost not yet computed by the capitol architect—it became apparent that the long-awaited fight against tax exempts is facing a showdown.

Some 200 members of both houses were revealed as having committed themselves to support the elimination of loopholes that permit many businesses to escape income taxes. Chances are bright for the adoption of a bill on the order of H. R. 5064, authored by Rep. Noah M. Mason (Rep., Ill:), that would impose taxes on all presently exempt income. Certainly, Mr. Mason currently looms as the leader of the revolt against tax exempts.

A member of the tax-originating Ways and Means Committee, Mr. Mason seeks primarily to make up the loss from the contemplated elimination or reduction of excise taxes. This loss, around $1 billion, he thinks, easily can be made up by taxing the tax exempts. Further, says Mr. Mason, the tax exempts are building up on the order of a prairie fire and something must be done soon to stop the trend or free enterprisers will have to retire on a wholesale scale through increasing competition from businesses that do not pay income taxes.

Nobody knows the exact total of tax-exempt incomes, but it is somewhere in the general neighborhood of $50 billion — or between 20 and 25 per cent of the total national income.

Spearheading the drive for adoption of the Mason bill are the National Associated Businessmen Inc., 1025 Vermont Ave. N. W., Washington, and the National Tax Equality Association, Chicago. The former has come up with an impressive story based on months of study.

Leading tax exempts, it finds, are the co-operatives owned, usually, by farm and labor organizations, and estimated to have a gross income of $17 billion. Illustrating the trend is the new chain of co-operatives being set up in Michigan by the United Automobile Workers—CIO to compete against tax-paying merchants in the sale of groceries, work clothes, electric appliances, automobile supplies, etc.

There is quite a trend, NAB reports, in shifting tax-paying businesses to the tax-exempt class through acquisitions by universities, as New York University's ownership of Mueller Macaroni Co., Ramsay Piston Ring Co., Limoge China Co., etc. It cites ownership by the University of Michigan of the Willow Run Airport, by Gonzaga College of radio station KGA, and by the University of Louisville of an interest in a tax-free foundation owning the famous Churchill Downs race track.

A new device, says NAB, is "sale and lease-back" by which Yale University, Union College and the University of Pennsylvania acquired the Macy store in San Francisco, the Allied stores in Schenectady, N. Y., and the Lit Bros. store in Philadelphia, and, by reason of tax exemption, have leased the stores at favorable rentals to their former owners.

Some 50 companies, including Textron, Goodall-Sanford and Beacon Mfg. Co., NAB points out, have moved to the latest tax dodgers' paradise—Puerto Rico, and the Duffy's Tavern radio program is broadcasted from there to escape income taxes.

Government-owned tax exempts are growing in number and constitute a menace to private enterprise, says NAB. It cites municipally owned traction and utility companies, state liquor monopolies. It mentions numerous tax-exempt businesses owned by the federal government. NAB particularly derides references to the TVA as a yardstick for the private power industry; there can be no comparison, it holds, because TVA is set up with taxpayers' money, pays no interest on investment and pays no income taxes.

Some churches, says NAB, have seen the handwriting on the wall. The Mormon church, "heavily involved in commercial enterprises of many diverse kinds has scrupulously paid its full share of federal taxes." The Catholic church of late has frowned on establishing tax-exempt institutions in areas already burdened with tax problems. But these are isolated rather than typical examples, says the NAB. Needed, it declares, is a restrictive definition within which any income must fall in order to merit tax exemption.

We'll have to sew up those tax leaks

Exporters Offered Protection

TO PROTECT interested exporters, the Office of International Trade placed a mandatory ban on export of unclassified technical information that might endanger U. S. security.

Exporters claimed the previous system (STEEL, Nov. 21, 1949, p. 62) left them at the mercy of foreign customers who might sue for damages because of failure to fulfill contracts. Here's how the change came about: The previous system called for voluntary compliance. The exporter could ask OIT if certain unclassified technical data might be exported without harm to the national security, but he was then free to export it if he so insisted. Under the new policy an exporter could defend himself against damage suits for unfulfillment of contract by showing that fulfillment was prevented by the government in a new exercise of power under the Export Control Act. No court, it is believed, would award damages in the face of such a ban.

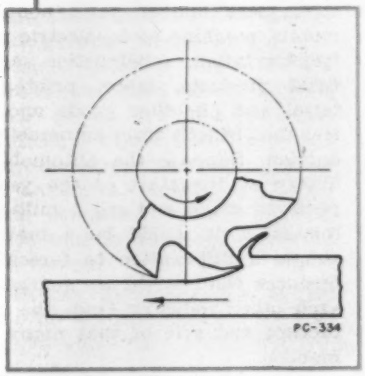
The new policy will not help ex-

For those who want to cut up

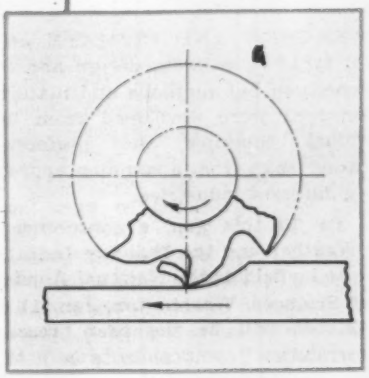
. . AND CUT DOWN TOO!

CINCINNATI No. 5 Plain Dual Power Dial Type. Ask for these catalogs: High Power Dial Type—M-1644. Dual Power Dial Type—M-1647.

Conventional, or up-milling cut. You know all about this, so just skip to the next drawing.



Down-milling cut. You'll find this of value in two cases: 1) thin parts, difficult to clamp; 2) where breakout of metal at the end of the cut cannot be tolerated. CINCINNATI High Power and Dual Power Dial Types handle operations like these.



Backlash is bad for table feed screws of milling machines, for it's tough on down-milling operations. With the realization that down-milling is sometimes highly desirable, Cincinnati Milling Engineers developed several automatic backlash eliminating devices, one type of which is incorporated in CINCINNATI High Power and Dual Power Dial Type Milling Machines.

> Through the action of two independent nuts on the table feed screw, a crown gear, meshing with teeth on the two nuts, tends to rotate them in opposite directions. Thus the backlash is entirely eliminated, and down-milling as well as up-milling operations may be assigned to these machines.

This is but one of the many standard features of value in CINCINNATI High Power and Dual Power Dial Types. Others . . . Dynapoise overarm, automatic table feed cycles. Additional features are outlined in attractive literature. It's yours for the asking.

THE CINCINNATI MILLING MACHINE CO.

CINCINNATI 9, OHIO, U. S. A.

CINCINNATI

MILLING MACHINES • BROACHING MACHINES • CUTTER SHARPENING MACHINES
FLAME HARDENING MACHINES • OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

porters escape retaliatory action such as has been employed by Iron Curtain countries, notably Hungary and Czechoslovakia, when American firms refused to divulge vital technical information. In such cases the employees of the firms involved have often been arrested and thrown in jail for indefinite periods, and properties and assets of the firms have been expropriated. Under present world conditions, the only recourse, as before, is to rely on the State Department in the hope that it will succeed through diplomatic methods in obtaining some measure of relief in such situations.

'Weather and Building Industry'

WEATHER AND CLIMATE affect all types of building design and construction, but methods and materials involved were developed from individual thinking and preferences rather than from a common approach by different industries.

To fill this gap, a conference on "Weather and the Building Industry" is to be held at the National Academy of Sciences, Washington, Jan. 11 and 12. It will be the first "research correlation" symposium to be held by the recently organized Building Research Advisory Board. It is the body to encourage co-operation between private industry and government in the field of building research (STEEL, Aug. 15, 1949, p. 68).

United States Weather Bureau officials, headed by Francis W. Reichelderfer, chief, hope that they will get at this meeting a much-needed statement of the building industry's requirements for weather data. A portion of the conference will be devoted to a presentation of weather data in the form of regional analyses of climate in the United States, and to discussion of their implications upon building research. Overall purpose of the conference is to stimulate increased interest in the solution of building research problems related to climatic factors.

Classifications Get Scrutiny

BELIEVING that much military information is withheld unjustifiably from the public, Hubert E. Howard, the Munitions Board's new chairman, has ordered a review of the board's publicity policy. Officers who classify, or have classified, information must advance very good reasons if the classifications are to be allowed to stick. The classifications involved are the customary ones: "Restricted," "confidential," "secret," and "top secret."

BLS Forging New Economic Tool

TO GET more accurate business forecasts, the Bureau of Labor Statistics is forging a new economic tool. It is a compilation of interindustry relationships showing how production and sales of each major finished commodity contributes to the volume of business in every industry.

Take Autos as an Example—The study will show the effect of production of a given number of automobiles —say 1000 units—on the demand for steel, glass, lumber, paint, nonferrous metals, machine tools, electric power, transportation, construction, agricultural products, labor, printed material and all other goods and services that benefit from automobile production. Suppose the automobile industry at the start of the year expects to make and sell 5 million automobiles. It would be a matter of simple multiplication to forecast the business that would be generated in each other industry from the manufacture and sale of that many automobiles.

The study will cover all industries and commercial activities that comprise the economy. When finished, the tabulation will be a balance sheet —occupying a single sheet of paper some 6 or 8 feet square— of all interindustry relationships, showing how conditions in each affect all the others.

Grows Out of Experience in War—W. Duane Evans, who heads the new Division of Inter-Industry Economics, with a staff of 50 people, says the new study grows out of experience in the war and immediate postwar years that showed dependable estimates of the consequences of anticipated economic developments can be made through this approach. In 1945, when the problem of a potential surplus in plant capacity was considered a serious one, BLS estimated that in 1947, following the immediate reconversion period, there might be a demand for as much as 100 million tons of ingot steel; subsequent developments proved that this estimate was reasonable. Good results were obtained by the use of this method in conducting studies for the Council of Economic Advisers, the Economic Cooperation Administration, the Department of Labor and other government departments and agencies.

Study Financed Largely by the NSRB—The new study is being financed largely by the National Security Resources Board which will use the pattern of interindustry relationships for its war mobilization planning. The results will be equally useful to private industry for forecasting purposes. Because of the ground to be covered, the study probably will not be completed much before June 30, 1952.

AEC Releasing Patents

MANY FIRMS will be interested in examining patents that the Atomic Energy Commission is beginning to release to the public.

The Commission hopes that discoveries covered will be helpful to industry. They are generally available on a royalty-free, nonexclusive basis.

The first batch to be released includes 67 patents that are to appear shortly in the Patent's Office *Official Gazette* under the heading "Register of Patents Available for License or Sale."

Most of them are of interest to one or more branches of the metalworking industry. Here are a few titles selected at random: "Furnace Control System," "Method and Apparatus for Producing Radiographs," "Torsion Balance," "Apparatus for Storage of Fluorine," "Method of Welding or Cutting Metal by Hydrogen-Fluorine Flame," "Adjustable Capillary Leak," "Quick Locking Furnace Base Plate," "Geiger Counter Improvement," "Meter Protection Circuit," "Direct Current Amplifier," "Preparation of Alkali Metal Compounds," "Attachment for Milling Machine," "Electrical Measuring Device," "Radiation Measuring Device," "Apparatus for Magnetic Measurements," "Producing Thin Film of Metal Oxide," etc. Each will be listed by patent number in the *Official Gazette* and will be described in digest form.

Got Any Films About Foundries?

COMPANIES owning motion picture films depicting foundry operations will do the Bureau of Mines a favor by telling the bureau about the content and availability of the films.

Letters should be addressed to M. F. Leopold, supervising engineer, U. S. Bureau of Mines, 2622 Interior Building, Washington. The bureau's interest arises from the fact that it is receiving inquiries from many schools and colleges that wish to use movies to give their students a better understanding of molding technique, cupola operations and other details of foundry practice.

The bureau has some 15,000 motion picture films showing manufacturing operations in various industries, but it doesn't have a single one on the foundry business.

Too Much Steel for Europe by 1953?

Industry may produce 7.7 million tons more than it can use or export by the time ERP ends. Danger of over-production spurs cartel talk

EUROPE'S steel production plant is expanding so rapidly that it may be turning out 7.7 million net tons more than it can use or export by 1953.

That is one conclusion reached by the Steel Division of the United Nations Economic Commission for Europe. Estimated annual steel production for all Europe—except Russia—may total 70.7 million tons of ingots and castings by 1953. The output for this area in 1949 was 58.1 million tons (See STEEL, Jan. 2, 1950, p. 126).

Soviet Output Up — The German publication *Stahl und Eisen* estimates that the Soviet steel production will hit 25.4 million tons in 1950. STEEL's estimate for the 1949 Russian output is 20 million tons.

The ECE Steel Division believes that Europe itself can consume only 58.5 million tons by 1953, provided the year is one of full employment. Its maximum exports by that time can be only 4.5 million tons, or 80 per cent of all overseas import requirements.

The threat of overproduction has been caused by Europe's intense nationalism. Every nation wants to be self-sufficient in steel, and most of them have been able to make a stab at self-sufficiency through the Marshall Plan. As of Dec. 30, total ECA aid to Western Europe topped $8 billion. The program started in April, 1948.

New Capacity Planned — Present plans call for construction in Europe of entirely new steel plants with a total capacity of between 3 million and 4 million tons. Capacity is being further increased by improvements in existing facilities. To prevent too much output, the Steel Division recommends a restudy of the steel investment and production programs and a closer analysis of the world market situation.

It does not recommend a return to cartels. In the past year, rumors have been frequent that European producers will seek to solve their problems by reviving the old monopolies to set prices and curb production. British, French and German steelmen all deny that they will participate in any kind of trust.

No Cartels for Britain

The strong British stand against cartels may be partly a byproduct of the industry's campaign against nationalization. Its theme has been that the industry has shown its efficiency and sincerity under private management in its contribution to British recovery. Why change to public ownership? The argument might be invalidated if industry flirted with cartels.

British steelmen will present a strong case for private ownership when the issue is finally decided at the next general elections. The domestic steel price is only 85 per cent above the 1938 level, but all wholesale prices are 127 per cent above 1938. Production has been climbing steadily. In November it was at an annual rate of 18,321,000 net tons, compared with a rate of 17,651,000 tons in November, 1948, a previous record.

The British steel industry is the only one in Western Europe still operating at capacity. Although demand is slackening slightly for steel products, the best customer, the auto industry, is still going strong. Domestic sales of cars and trucks are limited because exports are holding up well. Railroad equipment makers are also operating at high levels, and much of their work is for export. Industrial and utility construction is active and should continue to be for at least a year.

Higher freight rates came into effect Jan. 1, but the general price level of industrial products has not yet inched upward. One encouraging omen for price stability is the vote by coal miners to continue the wage freeze in their industry through 1950.

French Decry Monopolies

French iron and steelmen deny that any negotiations have taken place with the Germans regarding formation of a steel cartel. They say they are not as concerned with overproduction as other nations of Europe because their output is still below demand.

Much of the French exports go to underdeveloped African colonies. A greater proportion of Belgian and British exports go to areas which already have some domestic steel output or where the competition is particularly stiff, as in the Near East and South America.

Steel production fell in November to 955,000 net tons from 1,054,000 tons in October, but output is still 95 per cent of the target for the period.

Industry is relieved at the seaworthiness of Prime Minister Georges Bidault's governmental ship. It weathered a budget crisis at the end of the year and now can carry out its promises to balance the national expenditures and income. Industry supports Mr. Bidault even though he advocates higher taxes. France needs political stability now more than ever. A weak government would be unable to help shape the numerous economic unions currently in the embryonic stage. French industry knows its

BRIDGE BEHIND THE CURTAIN: To start work on the new Stefanik bridge in Prague, Czechoslovakia, a big iron-concrete caisson was lowered to the bottom of the Vistula river. Caisson, a pillar of the bridge, weighed 700 tons. Over 100 workers worked 13 hours lowering it inch by inch to the bottom

future expansion depends on participation by France in some soundly conceived union.

For the first time in more than 20 years the value of French exports in October exceeded the value of imports. This showing was influenced by the franc devaluation Sept. 20.

Domestic controls are gradually disappearing in France. Gasoline may now be bought and sold freely. The present price is about 50 cents a gallon, only two cents higher than the controlled figure. The coupon system remains only for coffee, but that beverage may be decontrolled.

French coal output reached 59.4 million net tons for 1949, only 1 million tons short of the record made in 1929 and 1930.

Germans Study Trust Laws

The West German government is tightening up its cartel laws and is studying U. S. legislation. Western German industrialists deny that they will join any steel cartels. "What companies would participate?" they ask.

That's a good question because the industry is in an amorphous state. It has yet to be reorganized under Law 75. Major reason for the long delay is the Allies' indecision as to what they want. Now even the French are coming to believe that it would be impossible to stir the whole industry up like a mess of stew and then come out with something satisfactory. German custodians, working on plans to reorganize the industry into vertical, integrated companies, have come up with just about what existed before.

It may be that Vereinigte Stahlwerke, once the largest steel company in Europe and slated for reshuffling, may be permitted to stay as is. One report has it that France and Britain will even capitalize this firm. The change of heart is coming because the French and British recognize that a strong Western Europe is impossible with a crippled Ruhr.

The Ruhr has been handicapped by lack of capital. Germans have been canvassing American financial opinion. If the Allies approve, private American funds may be flowing to Germany. First bottleneck has been broken by the ECA approval of release of nearly $200 million in counterpart funds to be invested in German power and steel plants, coal mines and transportation.

Germany's capital scarcities may also be helped by a December meeting between British government officials and Ruhr businessmen. Held in Dusseldorf, the gathering was behind closed doors, but it indicates a closer British-German relation.

Collapsible Tubes

Are being produced at a 40 per cent higher clip today than they were ten years ago

DID YOU forget to put the cap back on the toothpaste tube this morning? In this matter you and many others may be having greater trouble than ever because the metal collapsible tube industry is making 40 per cent more tubes now than ten years ago.

The Department of Commerce's Census of Manufactures shows that 1939 production totaled 3,994,339 gross of tubes. In 1949, output is estimated at 5.6 million gross. Sixteen manufacturers produced this; 45.1 per cent was made of aluminum, 29.5 per cent of lead, 17 per cent of tin-lead alloy and 8.4 per cent from tin. Census of Manufactures shows that the industry's 1947 dollar volume totaled $23,772,000.

Invented in 1841—The first collapsible tube was patented in 1841 by James Rand, an American, but the first commercial production was in Europe. Paint was the first product packaged this way, but now adhesives, cosmetics, dentifrices, detergents, foods, pharmaceuticals, shoe polishes and technical items are also tubed. Not until 1874 were collapsible tubes made in the United States. In 1915 Robert Victor Neher built the first aluminum collapsible tube plant in the world, in Switzerland.

Foreign production is still high, so only a small part of America's output is exported. Since the war, new manufacturers have begun operations in Canada, Mexico, Brazil, Colombia and the United Kingdom.

Made from Slugs or Discs—Metal collapsible tubes are made by cold impact extrusion from suitable slugs. One manufacturer, Wheeling Stamping Co. of Wheeling, W. Va., estimates that 200 extrusion presses are currently in production throughout the industry. Aluminum tubes are made from disks slightly less than the diameter of the finished tube. The disk is fed into the die cavity of a press. A punch, whose diameter equals the inside diameter of the tube, strikes the disk causing the aluminum to squirt up around the punch, to form the body of the tube. The shoulder and neck are formed at the same time; they take their shape from the die cavity.

Trimmed, Annealed, Decorated—From the extrusion press, tubes pass to a trimming machine where the body is cut to the desired length and the neck trimmed and threaded. Aluminum tubes are annealed to give them softness. The tubes are decorated by being placed on steel mandrels which revolve and bring the tubes in contact with enameling or printing rolls. Tubes are filled, closed and sealed by automatic or semiautomatic machines.

DECORATING ALCOA TUBES
. . . paint was packaged first

Byers Charges "Stock Holdup"

IN A letter sent to stockholders seeking proxies for the annual meeting Jan. 26, officers of the A. M. Byers Co., Pittsburgh, charge that a New York minority group demanded four of nine seats on the board of directors or $275,000 as its price for giving up an attempt to seize control of the company.

One leader of the group is identified by Byers officials as Dr. Louis Cohen, a dentist associated with a group two years ago known as "625 Associates" which tried to acquire control of Follansbee Steel Corp. Another is identified as John A. Kroese, a dealer in electrical supplies.

At the 1949 annual meeting, the present board was re-elected by unanimous vote of 220,000 shares represented and voting.

Lincoln Builds 20-Acre Plant

CONSTRUCTION of the Lincoln Electric Co.'s new $8.5 million plant at Euclid, O., delayed by the recent steel strike, is expected to be completed by the end of 1950. The 20-acre windowless plant, designed by the Austin Co., Cleveland, has a 60 foot service corridor extending 1427 feet underneath the center of the plant from one end to the other to eliminate non-manufacturing traffic from the production floor. Fiberglas insulated aluminum and steel panels are used for the sidewalls.

LP-Gas Use Gains

Phillips Petroleum Co. says 1949 total was 8.5 per cent higher than in 1948

AN ESTIMATED 2725 million gallons of liquefied petroleum gas were consumed in 1949, according to figures published by K. W. Rugh and E. O. Mattocks of Phillips Petroleum Co. That is an 8.5 per cent increase over the 1948 total.

The largest single use is for farm equipment and household appliances. About 1660 million gallons were used this way, a 12 per cent gain over 1948. More tractors use this fuel because it is quickly interchangeable with gasoline.

About 6.5 million homes now use LP-Gas for cooking, water heating, refrigeration and space heating. The use of LP-Gas by communities and utilities to make gas for transmission through pipe lines continued to grow in 1949. The fuel can be turned into the gas main if the gas producing facilities or natural gas lines are unable to meet demand in cold weather.

Research Grants Renewed

GRANTS-IN-AID to universities totaling $100,000 are announced for the second consecutive year by E. I. du Pont de Nemours & Co. Inc., Wilmington, Del. The grants are for unrestricted use in the field of chemical research and provide $10,000 to each of ten universities. The company also provides $20,000 to the University of Chicago for a 1950 membership in its Institute for the Study of Metals.

Du Pont recognizes that applied research in industry is dependent to a large extent upon fundamental knowledge developed by American universities. It further noted there has been a trend away from fundamental research and made these funds available to reverse the trend. The universities themselves select the research projects for which grants will be used, the only stipulation being that they be free from any commercial implication at the time the work is initiated.

From Tiny Acorns

STARTING with an initial capital stock subscription of $1400 at its birth in 1899, Driver-Harris Co., Harrison, N. J., faces its second half-century with a main plant that covers more than four city blocks plus additional facilities in England, Ireland, France and Italy. The company pioneered use of alloys for electrical resistance and other purposes and is today the largest company in the world devoted exclusively to the manufacture of electrical heating and heat resisting alloys.

Driver-Harris manufactures more than 80 different alloys to meet the needs of the electrical, electronic and heat treating fields. Its trade mark "Nichrome," used to designate the group of nickel-chromium compounds on which research was centered in 1905, is well known in the metal-working industry.

Frank L. Driver Jr., president, says the company's goal is still the same after 50 years of accumulated experience:

"We'll keep aiming at our original target, to develop new alloys and then make them better."

Construction Anniversary

POLLAK Steel Co., Cincinnati, celebrated the 30th anniversary of its entry into the construction field with a dinner for engineers, architects and others in the construction field. C. L. Volkman, manager of the company's construction division, presided over the dinner which included Julian A. Pollak, company president, as a speaker.

The company dates back to 1868 when it was founded in Cincinnati to specialize in forgings. Its entry into the construction field came in 1919 when a mill was purchased in Marion, O., to enable its expansion.

Die Casting Award Announced

AWARD program designed to stimulate advancements in the die casting industry is announced by the American Die Casting Institute of New York.

The award is made possible by a special fund donated by Doehler-Jarvis Corp., New York. It calls for a cash award of at least $500 and a plaque to be presented each year to an individual or related group of individuals making the most noteworthy contribution to the industry.

The presentation will be known as the American Die Casting Institute Annual Doehler Award. Selection of individuals who receive the awards will be made by the board of directors of the institute.

Entries must be submitted each year between Jan. 1 and Apr. 1. First award will be made at the annual meeting of the institute in September, 1950.

CALENDAR OF MEETINGS

Jan. 9-13, Society of Automotive Engineers: Annual meeting and engineering display, Hotel Book-Cadillac, Detroit. Society headquarters are at 29 W. 39th St., New York.

Jan. 10-11, American Home Laundry Manufacturers' Association: Fourth national home laundry conference, in Chicago.

Jan. 10-12, Conference on Industrial and Safety Problems of Nuclear Technology: Sponsored by New York University and Atomic Energy Commission, at New York University, Washington Sq., New York.

Jan. 10-12, Society of the Plastics Industry: Reinforced plastics division meeting and fifth annual technical session, Hotel Cleveland, Cleveland. Society headquarters are at 295 Madison Ave., New York.

Jan. 12-13, Southern Supply & Machinery Distributors' Association: Industrial distribution forum and midyear meeting, Edgewater Gulf Hotel, Biloxi, Miss.

Jan. 15-19, Associated Equipment Distributors: Annual meeting, Stevens Hotel, Chicago. Group's headquarters are at 360 N. Michigan Ave., Chicago.

Jan. 16-18, Truck-Trailer Manufacturers Association: Meeting, Edgewater Gulf Hotel, Edgewater Park, Miss. Association headquarters are at 809 National Press Bldg., Washington.

Jan. 16-19, Plant Maintenance Show: Sponsored by American Society of Mechanical Engineers and Society for the Advancement of Management, at the Public Auditorium, Cleveland. Mechanical Engineers' headquarters are at 29 W. 39th St., New York.

Jan. 18, American Society of Body Engineers: Annual dinner meeting, Detroit Leland Hotel, Detroit. Society headquarters are at 100 Farnsworth, Detroit.

Jan. 18-20, American Management Association: Conference on management problems, in San Francisco. Association headquarters are at 330 W. 42nd St., New York.

Jan. 18-20, American Society of Civil Engineers: Annual meeting, Hotel Commodore, New York. Society headquarters are at 33 W. 39th St., New York.

Jan. 19, American Iron & Steel Institute: Regional technical meeting, Hotel Statler, Buffalo. This meeting originally was scheduled for last Sept. 29, but had to be postponed because of the impending steel strike.

Jan. 20, Malleable Founders' Society: Semi-annual meeting, Hotel Cleveland, Cleveland. Society headquarters are in the Union Commerce Bldg., Cleveland.

Jan. 22-24, Institute of Scrap Iron & Steel Inc.: Annual convention, Hotel Statler, Washington. Institute headquarters are in the Dupont Circle Bldg., Washington.

Jan. 23-24, Industrial Furnace Manufacturers Association: Meeting, Dearborn Inn, Dearborn, Mich. Association headquarters are at 420 Lexington Ave., New York.

Jan. 23-26, Institute of Aeronautical Sciences: Annual meeting, Hotel Astor, New York. Society headquarters are at 2 E. 64th St., New York.

Jan. 23-27, American Society of Heating & Ventilating Engineers: Southwest air conditioning exposition, State Fair Park, Dallas. Society headquarters are at 480 Lexington Ave., New York.

Jan. 30-Feb. 1, American Material Handling Society, Chicago Chapter: Midwest material handling conference, in conjunction with Illinois Institute of Technology, in Chicago.

Feb. 2-3, Electric Maintenance Engineers of Milwaukee: 11th annual industrial electrical equipment exposition, at the Public Service Bldg., Milwaukee.

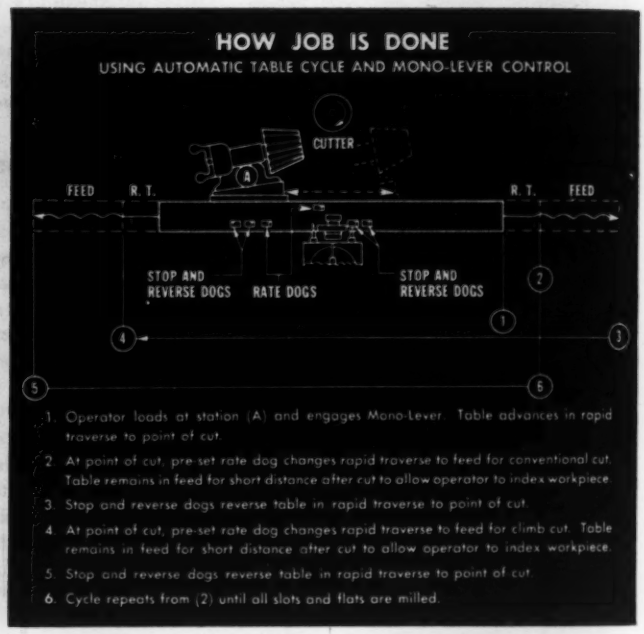
Feb. 9-10, American Foundrymen's Society, Wisconsin Chapter: 13th annual foundry conference, in Milwaukee. Chapter headquarters are at 610 W. Michigan St., Milwaukee.

Feb. 12-16, American Institute of Mining & Metallurgical Engineers: General meeting, Hotel Statler, New York. Institute headquarters are at 29 W. 39th St., New York.

Looking for savings?

96% INCREASE IN PRODUCTION SHOWN ON THIS JOB

Here's modern profit-making in action! This new Kearney & Trecker Model 2H Plain Automatic Cycle milling machine with Mono-Lever control increased production on this complex cast aluminum part 96%.


HOW JOB IS DONE
USING AUTOMATIC TABLE CYCLE AND MONO-LEVER CONTROL
CUTTER
FEED
R. T.
R. T.
FEED
STOP AND REVERSE DOGS
RATE DOGS
STOP AND REVERSE DOGS
1. Operator loads at station (A) and engages Mono-Lever. Table advances in rapid traverse to point of cut.
2. At point of cut, pre-set rate dog changes rapid traverse to feed for conventional cut. Table remains in feed for short distance after cut to allow operator to index workpiece.
3. Stop and reverse dogs reverse table in rapid traverse to point of cut.
4. At point of cut, pre-set rate dog changes rapid traverse to feed for climb cut. Table remains in feed for short distance after cut to allow operator to index workpiece.
5. Stop and reverse dogs reverse table in rapid traverse to point of cut.
6. Cycle repeats from (2) until all slots and flats are milled.

Here's how this big production increase was accomplished. Table cycle was preset to allow for indexing. Backlash eliminated by adjustable table feed screw nut — climb and conventional cuts were done equally well

COMPARE

Production by old method.

Production gain using a Kearney & Trecker Milling Machine with Mono-Lever Control and Automatic Table Cycle.

HERE'S GRAPHIC PROOF OF SAVINGS

1. 16%—The minimum over-all savings reported from any job when done on a Kearney & Trecker Milling Machine with Mono-Lever Control and Automatic Table Cycle.
2. 16%-49% — The *majority* of over-all savings from jobs done on these machines fall here.
3. 49%-96%—Under favorable conditions, several jobs done on these machines have shown savings like this!

YES, here is a positive answer to cutting high shop costs — Kearney & Trecker milling machines with Mono-Lever control and Automatic Table Cycle.

The job data shown here, plus the bar graph, at the left, shows what other users have done AND *what you can expect* . . . savings of 16% to 96% on most milling operations.

Contact us or our nearest representative today. Get the facts on how Kearney & Trecker milling machines with Mono-Lever control and Automatic Table Cycle can cut your costs, increase your savings. No obligation. Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wis.

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Nash seeks public reaction to $1000 light car, powered by foreign engine. Mockup model to be shown in leading cities. No plans yet made to place it in mass production

DETROIT

NASH is busy "surviewing" public opinion in various sections of the country on the merits of a snappy little convertible which could be sold for $1000 or less. No plans have crystallized for placing the model in production, no tools have been designed, the car has been assembled only in mockup form. It was shown first last Wednesday in New York at the Waldorf to 600 invited guests. Other appearances were scheduled to follow in Washington, Detroit, Chicago, Los Angeles and San Francisco.

Experimental in Concept — Purely an experimental concept and not to be confused with the new light model which Nash will place in production shortly, the N.X.I. as it is called (Nash-Experimental-International), is 145 inches long on 84-in. wheelbase and 47-in. tread. Overall height is 53 inches and width 62 inches. It could be built as a convertible, sports roadster or two-door coupe.

The international angle springs from a proposal that power would be furnished by low-horsepower 4-cylinder engines of foreign manufacture—Italian, British or French—with perhaps axles and transmissions also made abroad, thereby contributing to the relief of dollar shortages in these countries and at the same time possibly opening up attractive export markets. The company plans to poll the opinions of about 250,000 persons and any decision to begin manufacture would be based on their sentiments. It would probably require a year's time plus expenditure of several million dollars to get the project rolling. New assembly plants would have to be acquired on the East and West Coasts.

Powered with Italian Engine—The particular N.X.I. shown is powered with an 18 hp Italian-built engine which would give 45 to 50 miles per gallon and a top speed of 60-64 mph, gross weight of the vehicle being 1350 lb. Alternate engines include a Fiat of 36 hp rating which would deliver 35-40 miles per gallon and top speed of 65-70 mph, weighing 100 lb more. Both these engines are coupled to four-speed transmissions. A third power plant is an English-built "Standard" of 36-hp rating with three-speed transmission.

Conventional exterior design has been simplified in many ways. Front grille and bumper are combined into a single unit. Chrome moldings have been eliminated. The drop center one-piece windshield, extending even below the fender line, conforms to the curving lines of fender and hood. The engine hood, front fenders and lights are combined in one assembly which may be raised from the front for servicing. The trunk lid has been eliminated, a slot in the rear accommodating the spare tire and storage space being accessible from inside the car behind the two seats.

American Design—Leg room equivalent to the average full-size U. S. cars is provided and the overall design is based on the integral body and chassis system used by conventional Nash models. An unusual touch is a curved-out section in the top edge of each door, providing a comfortable arm rest for the driver and passenger. In bad weather, plastic side curtains slide up from the doors and can be snapped quickly to the frame of the top. Plastic windows are provided in the rear section of the top, giving good vision well around into the rear quarters. The body shell is carried down over both front and rear wheels and the flatness of the body side is relieved by a raised strip along the full length at the bumper line.

By using established European engines, transmissions and axles, or important parts of these power units, it is figured appreciable savings could be realized on tooling which limited sales would not justify. Further there would be no need to underwrite extensive development costs which new domestic components would entail. What Nash would like to know, among other things, are the answers to these questions: Is it a satisfactory second car for two-car families? Would it be acceptable to families needing two cars but not able to afford two of those presently available? Will the all-day "car parking" commuter or those who drive their cars to work be interested, preferring to pay $1000 for a new economy model than to buy a comparably priced used car? Would young married couples buy it? Would young single men and women buy it? Would women prefer a small two-seater car for ease of handling, parking and economy? Are there enough potential buyers who would be satisfied with a car having a top speed of 65-70 and considerably less "stoplight" acceleration?

Negative Reaction in Past—Past surveys undertaken by the automotive industry, Ford and Chevrolet to name two, have indicated negative responses to most of these queries. Maybe times are changing, and maybe the added plus values of the foreign tie-in place a new complexion on the N.X.I. At any rate, Nash is going to find out. Meanwhile, the finishing touches are being put on production facilities for a new "Y" model in the 2500 lb classification to round out its line of domestic passenger cars. It is reported to have 6-cylinder engine and 100-in. wheelbase, with exceptional fuel economy and "interesting" price.

Automobile Production

U. S. and Canada Passenger Cars and Trucks—

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,966
June	623,689	454,401
Six mos.	3,134,055	2,617,581
July	604,351	489,736
August	678,092	478,186
September	657,078	437,181
October	601,021	516,814
November	474,731	495,488
December	392,000*	514,337
12 mos.	6,541,323*	5,549,323

* Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
Dec. 17	86,226	123,315
Dec. 24	116,567	94,868
Dec. 31	110,319	81,968
	1950	1949
Jan. 7	115,000	98,422

Estimates by Ward's Automotive Reports

Chevrolet Shifts Into High

CHEVROLET is rolling up both sleeves and tearing into the 1950 market with a vengeance, not con-

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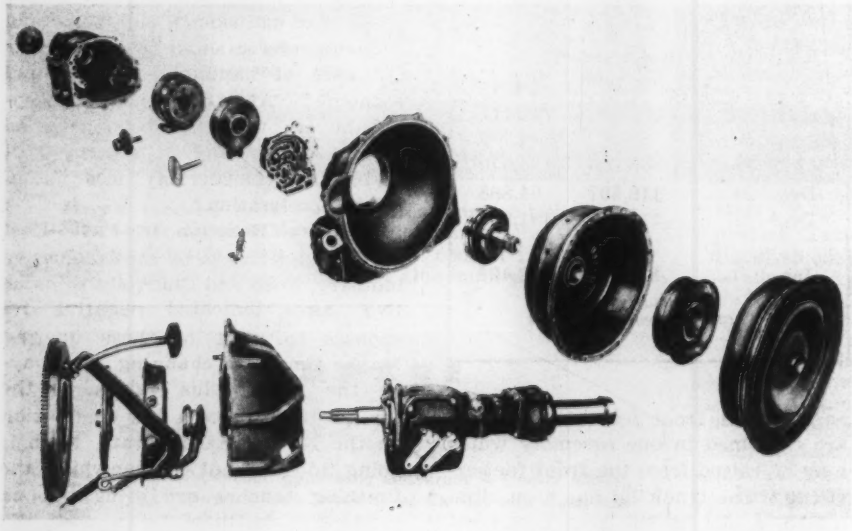
tent with again having outdistanced the field last year by production of approximately 1.5 million cars and trucks. A hefty advertising appropriation of $51 million is being laid on the line by factory and dealers, the largest outlay on record and making use of just about every known media (excepting business magazines). Materials commitments for April were released last week and it looks like the division in the first four months of this year will come within 100,000 units of the total for the first six months of 1949, the latter being little better than 720,000 units.

Chevrolet dealers showed a profit on used car operations, at least through November of last year and their used cars ratio was only 0.61 to 1, against a prewar average of 2 to 1. Chevrolet management is betting there will be no pile-up and is backing up this belief with an all-out intensive merchandising effort.

Cost Up—Costs are up, to be sure. Yet Chevrolet is not raising prices; in fact, is reducing the price of its striking hard-top convertible, the Bel-Air, to a figure $100 under the regular convertible, and is lowering the price on an all-steel station wagon to $250 under the former wood station wagon. The latter body type appears gone for good from the Chevvie line. Higher steel prices are the cause of considerable concern to the division management, but the effort will be made to absorb them which would appear to give the pitch for the entire industry.

The big noise from Chevrolet this year will be over the new Powerglide transmission, with sights already being drawn on output of 1000 per day, sufficient to equip about 20 per cent of total passenger car assemblies. The transmission is machined and assembled at a Cleveland plant which Chevrolet started in operation late last year, the first unit coming off the line Nov. 7. The five-element torque converter section, however, is produced by the division's pressed steel department in Flint. It is of most unusual design and construction, comprising pressed steel housings, rings and radial vanes, locked in position mechanically, by spot welding and finally copper brazing. Hydrogen brazing is done in a 230-ft furnace and cooling chamber, the copper being applied by dipping the assembled steel unit in a mixture of 500-mesh copper powder and liquid hydrocarbon and then passing through the 1950-degree brazing heat on a conveyor, and into a 200-ft cooling zone where the temperature is eased down gradually to 80 degrees. The brazing and cooling operation requires 30 minutes.



POWERGLIDE TRANSMISSION: Exploded view of Chevrolet's automatic transmission is offered as optional equipment on 1950 models. Principal operating parts (left to right) are: Turbine and pressed steel housing; primary and secondary stators of pressed steel with vanes copper brazed in position; primary pump and housing, outer row of vanes being an over-running coupling to prevent free wheeling with engine power off; front oil pump; cast iron bell housing; die-cast valve body to control all oil flow; hydraulic multiple-disk clutch with low-range band; planetary gearset with reverse band—comprising ring gear, two-diameter sun gear and six planet pinions; cast iron transfer case with parking pawl and detent lever (manual control correction); and rear oil pump. At the bottom is the conventional manual gearshift: Flywheel, clutch disk and pedal, clutch pressure plate, clutch throwout mechanism, cast iron housing, and three-speed-plus-reverse manual-shift transmission

"Power Team" Redesigned — To give the desired performance and economy, the transmission is coupled to a redesigned "power team." Engine displacement has been boosted for more power. Increased cooling and greater intake and exhaust valve capacities are introduced, along with hydraulic valve lifters, repositioned manifold and larger radiator. Rear axle ratio is reduced from 4.11 to 3.55 to 1 to lower engine speeds and at least partially offset the unavoidable economy loss incident to the torque converter transmission. Engineers figure the complete power team will provide equivalent economy to the former synchromesh transmission in country driving, with a 1 mile per gallon loss involved in city driving. However, good acceleration and the ease and convenience of operation are calculated to more than offset the slight drop in fuel economy. Another important feature of the torque converter is an over-running coupling or check vanes which function only when car speed is sufficient to drive the engine as when descending a hill, thus providing a measure of engine braking not realized with other torque converters.

"Low" and "reverse" positions are provided through a multiple-disk clutch and a single planetary gearset comprising ring gear, sun gear and six planet pinions. They are controlled through the clutch by two brake bands, faced with sintered powdered metal and actuated by a hydraulic system in turn regulated by a lever on the steering column. Front and rear oil pumps furnish the necessary oil pressure directed through the proper channels by an intricately cored valve body, made of cast iron instead of a zinc die casting, as in the Hydra-Matic and Dynaflow transmissions for example. The valve body is mounted in a vertical position inside the transmission housing, thereby minimizing the possibility of leaks.

Five Elements—As mentioned, the converter is made up of five elements—a primary pump and turbine of doughnut shape, with curved vanes fitted to the outer walls, two stators and a secondary pump, the latter being true wheels in shape, smaller than the first two elements and with vanes resembling flattened and slightly curved spokes set at an angle. They are mounted so they will free wheel in one direction but be locked in the other direction.

Control lever for transmission has five settings—park, neutral, drive, low and reverse. The engine may be started only in the first two, and in the first position the car is locked by engagement of a pawl with a gear on the transmission.

The bare facts about ball bearings

Cut-away view of New Departure Ball Bearing

Rugged New Departure Ball Bearings lick friction with free-rolling, tough, forged steel balls.

They welcome today's more exacting requirements of higher speeds, heavier loads and continued precise positioning of moving parts.

And . . . most important of all, New Departure, world's greatest ball bearing maker, meets your particular problems with a vast fund of experience and *original thinking.*

1

Nothing Rolls Like A Ball. It is nature's favorite, strongest form. Having no ends, it rolls freely in any direction.

2

Under heavy compression it deforms slightly and then resumes its original form. Made of the toughest, most resilient steel known to man, the New Departure steel ball is of uniform structure throughout.

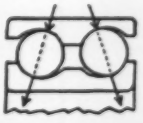
3

Its inherent resistance to load is greatly increased by curved raceways which, under load, are nearly filled by an arc of the ball. "Point contact" talk is the bunk. Actually, its contact is an ellipse, like this:

4

This is how a ball resists thrust (axial loads) as well as radial loads — like a bicycle on a banked track.

5



Put two rows of balls together, and you can support thrust and radial loads from any direction. They may be in one single bearing or in two separate bearings.

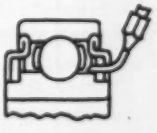
6

Unlike other types of rolling elements, the ball need not be forced to travel in the proper direction. Function of separator is merely to keep balls spaced. Contact is at poles (point of slowest rotation — least friction.)

7

Only ball bearings may be self-sealed with integral closures of felt and metal. In average conditions New Departures are lubricated for life. Other type bearings cannot maintain precise "inter-fitment" needed to maintain efficient sealing.

8



Newest new departure *by* New Departure: Lubrication in new sealed bearings may be revitalized by injecting with hollow needle on pressure oiler — without removal of seals or need for nipples, grease passages, plugs.

Nothing Rolls Like a Ball

NEW DEPARTURE
BALL BEARINGS

NEW DEPARTURE • Division of General Motors • BRISTOL, CONN. • Branches in DETROIT • CHICAGO • and Other Principal Cities

Follansbee Steel Corp.

Sells Toronto, O., plant to Kovalchick Industries. Price not disclosed

FOLLANSBEE Steel Corp. sold its Toronto, O., plant and equipment to Kovalchick Industries Inc., Indiana and Sykesville, Pa.

The price was not disclosed. Kovalchick, a plant disposal company, is supposed to have several prospects interested in acquiring the Toronto plant. It includes four open-hearth furnaces that have an annual capacity of 136,000 tons of steel, a bar and billet mill and auxiliary equipment. The plant has been idle since last April.

Announcement of the sale came jointly from M. A. Follansbee and Nick Kovalchick, presidents of the companies that bear their names.

Mr. Follansbee says his company is concentrating activity at its Follansbee, W. Va., plants. The company has facilities for turning out annually 50,000 tons of silicon sheets, 12,000 tons of long terne sheets and 180,000 tons of cold-rolled strip.

Superior Sheet Steel Resumes

SUPERIOR Sheet Steel Co., Canton, O., purchased last fall by Louis Berkman, president of the Louis Berkman Co., Louisville, O., from Borg-Warner Corp., Chicago, has resumed operations. The plant will produce carbon sheets, flat and corrugated galvanized and galvannealed sheets and long ternes. Capacity exceeds 10,000 tons per month. The plant formerly employed 600 persons.

Irving J. Berkman is general manager of sales and also named general manager of sales, steel mill products, of the Parkersburg Steel Co., Parkersburg, W. Va.

Worthington Supplies S. A. City

CARTEGENA, Colombia, wanted to attract industries and develop its commerce. Its chamber of commerce and public works commission realized that an adequate power supply is an important requisite for industrial growth. So Cartagena is going to have its new power plant.

Worthington Pump & Machinery Corp., Harrison, N. J., is going to supply all the equipment for the new plant. Paul W. Anderson, consulting engineer of New York is the designer. Initial equipment in the new plant will include two Worthington 2500 kw turbine generators complete with condensers and all auxiliaries. Two Foster Wheeler boilers will each provide 40,000 lb of steam per hour at 430 lb of pressure and 750° F. The switchboard, supplied by Electric Machinery Mfg. Co., a Worthington subsidiary, has two main generator panels, six feeder panels and an auxiliary station power supply board.

FOR THE "COG WHEEL" ROUTE: The Manitou & Pikes Peak railroad climbs Pikes Peak on rack rails made of Jalloy, Jones & Laughlin Steel Corp.'s newly developed low-cost alloy steel. When a cog locomotive is climbing or descending with normal load, wheels exert 7.5 tons on each tooth in the rack rails

National Tube Boiler Plant

A NEW BOILER plant will change the skyline at National Tube Co.'s National Works at McKeesport, Pa. Seven stories high, it will be the tallest structure there. Structural steel framework for the U. S. Steel pipe-making subsidiary is already going up.

The boilers will be going full steam in the spring.

The project is the most extensive modernization move at the McKeesport plant since before the depression in the 30s.

It is the second major development undertaken there in recent months. First announced was a new mill for turning out electric welded steel pipe.

The new facility at McKeesport will have five high-pressure boilers, each capable of putting out 175,000 lb of steam per hour—more than enough required to operate the big pipe plant at full capacity. In maximum use the boiler plant will require 14.5 millions gallons of water every day, including 10 million gallons for cleaning blast furnace gas. Principal fuel for firing the boilers will be washed gas from the plant's four blast furnaces.

Simplifies Corporate Structure

TO INCREASE efficiency and consolidate operations, Air Reduction Co. Inc., New York, simplified its corporate structure, effective Jan. 1.

The change involved liquidation of all the wholly owned domestic subsidiaries of Air Reduction. The businesses conducted by the active domestic subsidiaries are now conducted by corresponding divisions of the corporation. Foreign subsidiary companies are not involved.

Ceco Continues Expansion

TO PROVIDE space for building products made in off-season months —thus stabilizing employment—Ceco Steel Products Corp. started a new addition to its Plant No. 1. in Chicago.

The addition, to be in the rear of the plant, will provide 50,000 sq ft. of added floor space.

Ned A. Ochiltree, president, says: "This past year when so many firms were laying off people, operating only part time, we were going strong —even working some overtime. We want to continue to provide such steady work for our permanent employees, and the new addition fits into these plans."

Other Ceco buildings are going up in the company's nationwide expansion program. Within the last year the company erected new plants and offices in Washington, San Francisco and Detroit.

Briefs . . . .

A cash bid of $1.8 million from **American Steel & Tube Corp.,** Cleveland. (STEEL, Nov. 28, 1949, p. 44) for Scullin Steel Co., St. Louis, was accepted by General Services Administration. The Scullin plant was built by the government during the war for manufacture of large ordnance castings. The plant originally cost $12,930,000.

—o—

Sawhill Mfg. Co., Sharon, Pa., acquired patent rights to the new adjustable basement post developed by Summit Steel Products Co., Akron, O. The Sawhill post will be known as the Red-I-Post. Paul Shaffer is sales representative for the Red-I-Post Division. Sawhill specializes in pipe and tubing fabrication.

—o—

Graver Water Conditioning Co., New York—equipment for all water conditioning processes—appointed Russell R. MacDonald Co., Richmond, Va., as its sales engineering representative in that territory. Graver also named Brookman-Kron Associates, Buffalo, representative for the Buffalo area.

—o—

Brown & Sharpe Mfg. Co., Providence, R. I.—milling, grinding, screw machines, etc.—opened its new Los Angeles office Jan. 1. The new office for the company's California customers is under direction of Thomas F. MacLaren.

—o—

Ferro Enamel Corp., Cleveland, transferred manufacturing and distributing rights of its complete line of Ferro cleaning compounds to MacDermid Inc., Waterbury, Conn. Ferro metal cleaning compounds will be manufactured by MacDermid at its plants in Cleveland, Chicago and Waterbury.

—o—

Soss Mfg. Co., Detroit—hinges for automobiles, furniture and general building purposes—appointed B. F. Schoen Ltd., Honolulu, T. H., as sales representative in Hawaii.

—o—

A Venezuelan industrialist, Miles M. Sherover of Caracas, bought 100 steel and porcelain Lustron Homes for sale in South America. Lustron is in Columbus, O.

—o—

Wheeling Steel Corp. plans to retain its range boiler works in Portsmouth, O. This became evident when Wheeling Steel officials were assured that expansion of **Portsmouth Steel Corp.** this year will not interfere with Wheeling operations in the Portsmouth plant which Wheeling has been operating since July, 1946. Portsmouth Steel, taken over by **Detroit Steel Corp.** last week, expects to invest about $10 million in 1950.

—o—

Edgcomb Steel of New England Inc., Milford, Conn., will handle a complete line of Alcoa aluminum mill products for distribution throughout New England and eastern New York. Edgcomb's physical plant is being enlarged to accommodate Alcoa's full line of standard stocks.

—o—

Armco Steel Corp., Middletown, O., granted a license to Inland Steel Co., Chicago, to use its patented process for continuous coating of flat-rolled sheet and strip steel in a bath of molten zinc.

—o—

Fairchild Guided Missiles Division is the new name of the Pilotless Planes Division of Fairchild Engine & Airplane Corp., Farmingdale, N. Y.

—o—

Royal American Mfg. Co., Baltimore, is equipping 30,000 sq ft for the manufacture of chrome dinette sets and unfinished furniture. The company expects to occupy early this year 40,000 additional square feet in an adjoining building.

—o—

Colorado Fuel & Iron Corp. early in 1950 will start a $3 million expansion and improvement program at its new Pueblo, Colo., plants, says Carl Meyers, president. Expansion will include a new rail splitting and rerolling mill. Work is expected to be completed in 1951.

—o—

Mansfield Steel & Supply Co.—structural steel posts, columns, plates, pipe, tubing for fabricating television stacks, towers and antennas—opened its warehouse and offices in Mansfield, O.

—o—

Allied Research Products Inc., Baltimore, plans shortly to equip an additional 10,000 sq ft in an adjoining structure, thus doubling its present capacity. Allied produces Iridite, a patented chemical hitherto used only in zinc and cadmium plating. Processes have been worked out in the firm's laboratory that permit the chemical to be used with aluminum, brass, and copper.

—o—

Milwaukee File Co., Milwaukee, added Thermit Welding equipment to its present line, Lee Anderson, secretary of the Milwaukee firm says. Thermit welding originated by Thermit Welding Co., Chicago, is a process by which an actual remolding of broken metal parts is accomplished.

—o—

Ironton Firebrick Co., Ironton, O., put into operation its new specialty unit for manufacture of refractory cements and specialty products for the steel and foundry industries.

—o—

United Iron & Metal Co., Baltimore, started work at its Catherine street site (the company has two plants in Baltimore) for the erection of a one-story building, 40 x 200 ft.

—o—

Fafnir Bearing Co., New Britain, Conn., is acquiring a building in Philadelphia—4006 York Road. The structure now houses Fafnir's branch office and warehouse stock. Thomas A. Savage and Charles Haefner are Philadelphia manager and assistant.

—o—

James F. Lincoln Arc Welding Foundation, Cleveland, reports that the plans for a proposed suburban railroad station which called for the use of a welded structure won for James Edgar Steed, Washington Court House, O., one of four $250 scholarships established at the University of Cincinnati by the foundation.

—o—

Phillips Screw Co., American Screw Co., and 16 other screw and screw driver and bit manufacturers have consented to a final judgment entered by the Justice Department in the Federal Court at Chicago, which terminates various domestic and foreign restraints in the field of cross-recessed head screws and bolts, commonly known as Phillips screws, and tools used in connection therewith. Domestic and international patent license agreements were canceled.

—o—

Texas Gas Transmission Co., Shreveport, La., and Texas Eastern Transmission Corp., Owensboro, Ky., have received authorization from the Federal Power Commission to construct additional pipelines from Texas and Louisiana to Ohio. Estimated cost will be $97,520,000.

—o—

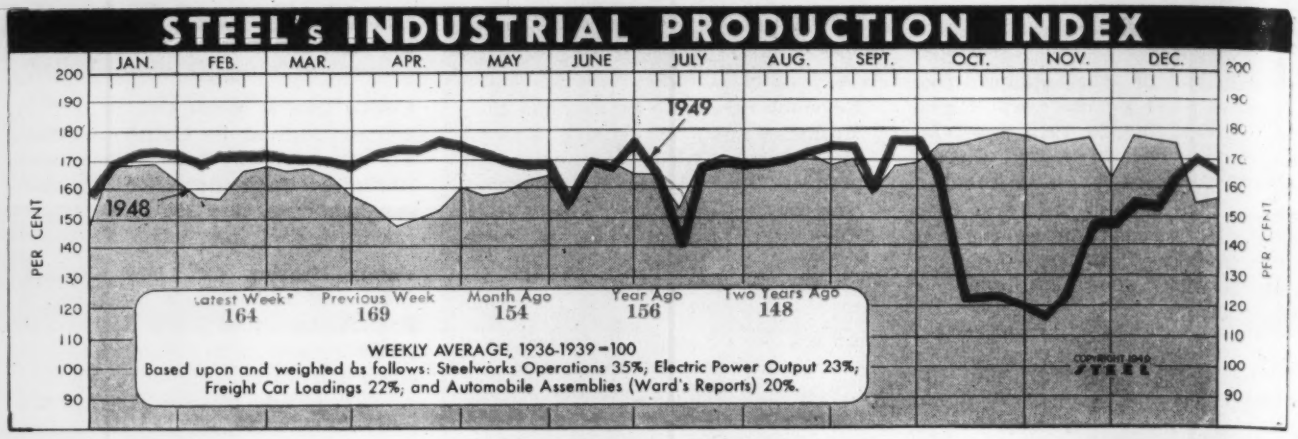
General Electric Co., Schenectady, N. Y., reports that 17,629 of its employees received cash awards totaling $277,217 during 1948 for suggested ideas leading to improvements in plant and office operations.

—o—

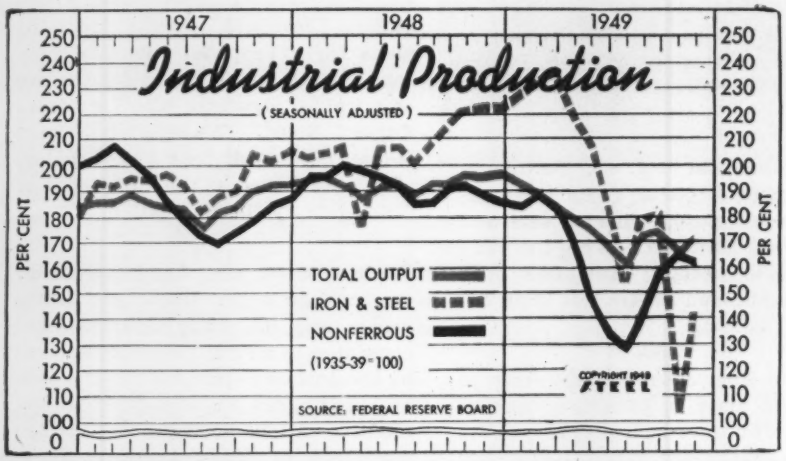
Wellman Bronze & Aluminum Co., Cleveland, has formed a new Permanent Mold Castings Division which has furnaces available for handling aluminum and magnesium castings of any size adaptable to permanent molding.

—o—

MacKenzie Muffler Co., Youngstown —automobile and tractor mufflers and oil filters, reopened its plant and expected to be in full production last week, Arthur G. Haugh, vice president and general manager, said.

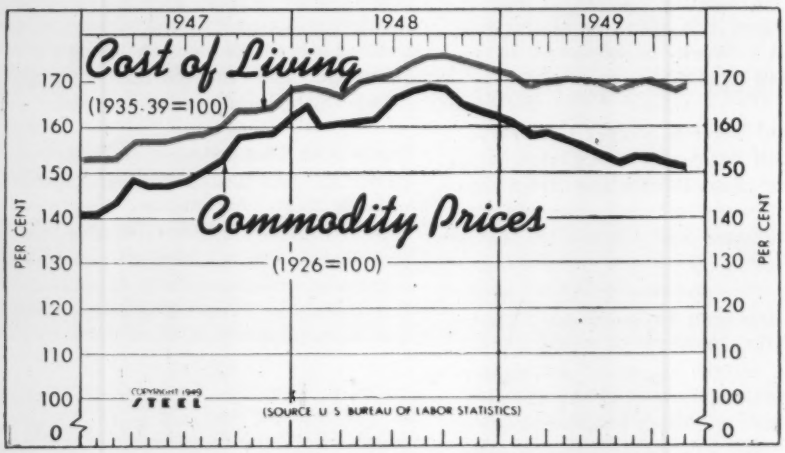

STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
PER CENT
1948
1949
Latest Week* 164
Previous Week 169
Month Ago 154
Year Ago 156
Two Years Ago 148
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
COPYRIGHT 1949 STEEL

* Week ended Dec. 31 (preliminary).



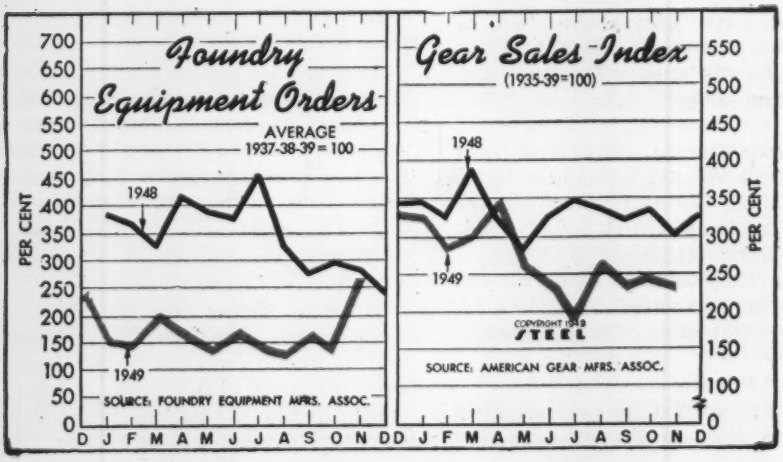
Federal Reserve Board's Production Indexes (1935-1939=100)

	Total Production		Iron, Steel		Nonferrous	
	1949	1948	1949	1948	1949	1948
Jan.	191	193	228	203	184	197
Feb.	189	194	232	203	186	197
Mar.	184	192	233	207	183	200
Apr.	179	188	219	177	168	198
May	174	191	204	206	145	196
June	169	192	177	208	132	194
July	162	186	156	201	128	185
Aug.	170	191	178	207	141	186
Sept.	174	191	179	214	157	192
Oct.	166	195	103	221	164	192
Nov.	171	195	142	224	161	187
Dec.	...	192	...	222	...	185
Ave.	...	192	...	208	...	193



Wholesale Commodity Price—Cost of Living Indexes

	Commodities (1926=100)			Living Cost (1935-1939=100)		
	1949	1948	1947	1949	1948	1947
Jan.	160.5	165.7	141.5	170.9	168.8	153.3
Feb.	158.1	160.8	144.5	169.0	167.5	153.2
Mar.	158.4	161.4	149.5	169.5	166.9	156.3
Apr.	156.9	162.7	147.7	169.7	169.3	156.2
May	155.7	164.2	147.1	169.2	170.5	156.0
June	154.4	166.4	148.0	169.6	171.7	157.1
July	153.4	168.7	150.8	168.5	173.7	158.4
Aug.	153.0	169.5	153.7	168.8	174.5	160.3
Sept.	153.6	168.7	157.4	169.6	174.5	163.8
Oct.	152.2	165.2	158.5	168.5	173.6	163.8
Nov.	151.6	164.0	159.6	168.6	172.2	164.9
Dec.	162.3	163.2	....	171.4	167.0	
Ave.	164.9	151.8	....	171.2	159.2	


Foundry Equipment Orders
AVERAGE 1937-38-39=100
1948
1949
PER CENT
SOURCE: FOUNDRY EQUIPMENT MFRS. ASSOC.
Gear Sales Index
(1935-39=100)
1948
1949
COPYRIGHT 1949 STEEL
SOURCE: AMERICAN GEAR MFRS. ASSOC.
D J F M A M J J A S O N D D J F M A M J J A S O N D

Foundry Equipment Orders* / Gear Sales

	Foundry Equipment Orders* Index (1937-1939=100)		Gear Sales Index (1935-1939=100)	
	1949	1948	1949	1948
Jan. ...	149.9	380.9	320.7	346.8
Feb. ...	144.4	367.3	282.3	324.4
Mar. ..	190.8	326.2	299.1	389.8
Apr. ...	172.0	412.0	339.0	320.9
May ...	121.9	388.5	250.1	283.6
June ..	164.9	376.8	227.8	324.1
July ...	146.6	456.3	193.1	348.4
Aug. ..	127.1	324.7	262.0	335.6
Sept. ..	166.6	273.5	224.9	320.4
Oct. ...	133.5	296.0	242.3	333.3
Nov. ..	270.4	284.4	230.7	309.0
Dec. ...	....	243.7	....	325.9

* By foundry trades only.

The Business Trend

SLOWDOWN in production because of the holiday caused STEEL's industrial production index for the week ended Dec. 31 to decline 5 points from the level for the preceding week to a preliminary 164 points of the 1936—1939 average. Following the holiday lull the index is expected to climb above the current mark as automobile assemblies hit a faster pace, steelmaking continues strong, power output remains at an alltime high and freight carloadings register gains over the corresponding 1949 period. These predictions are all for the near-term. By mid-year some weakening is forecast in all of the categories that make up STEEL's index, not all of them will continue strong even that long.

AUTOMOBILES—Outturn of 90,403 passenger cars and 19,916 trucks in the week ended Dec. 31 closed the biggest year in the auto industry's history. The preliminary total of 5,118,900 cars and 1,130,500 trucks in U. S. plants and 191,880 cars and 100,200 trucks in Canadian plants easily eclipses the alltime high chalked up in 1929. Assemblies will be at a high rate in the first half of this year but a slackening in the second half is expected. Total for 1950 is expected to be 10 to 12 per cent below 1949 and the more pessimistic observers say it will be even lower.

STEEL—Production of steel for ingots and castings dipped only 1 point in the week ended Dec. 31 from the rate for the preceding week. At 93.5 per cent of capacity it was 4 points lower than in the like week in 1948. Demand continues strong and mills have large backlogs. This condition is expected to continue throughout the first quarter. Second quarter prospects are uncertain.

CARLOADINGS — Freight carloadings in the first quarter of 1950 will be 2.3 per cent above those in the same 1949 period, say the 13 Regional Shippers Advisory Boards to the Association of American Railroads. On the basis of these estimates freight carloadings of the 32 principal commodity groups will be 6,770,603 cars in the first quarter of 1950. In the like 1949 period they were 6,617,850 cars.

BUSINESS—Business failures in November were up 4 per cent from October and reached 835. Casualties were almost twice as numerous as a year earlier. Liabilities fell to $22,799,000 from $23,894,000 in October and $24,416,000 in November, 1948. November's new business incorporations dropped 1.8 per cent from the October total to 6755.

CONSTRUCTION—Civil engineering construction volume totaled $66,858,000 in the week ended Dec. 29. This total is 57 per cent below the preceding week and 14 per cent lower than in the like 1948 week. Private awards were off only 2 per cent from the year ago total but public awards were down 23 per cent. Heavy construction for 1949 to the reporting date was $8,157,403,000, an increase of 15 per cent over the corresponding 1948 total. Construction in 1950 will continue in good volume because of public awards. Industrial building will decline.

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	93.5	94.5	89.5	97.5
	Electric Power Distributed (million kilowatt hours)	5,850‡	5,994	5,743	5,562
	Bituminous Coal Production (daily av.—1000 tons)	1,507	1,452	2,108	1,630
	Petroleum Production (daily av.—1000 bbl)	4,900‡	4,995	5,105	5,600
	Construction Volume (ENR—Unit $1,000,000)	$66.9	$155.5	$219.6	$78.1
	Automobile and Truck Output (Ward's—number units)	110,319	116,567	72,994	81,968
	*Dates on request. †1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons. ‡Preliminary.				
TRADE	Freight Car Loadings (Unit—1000 cars)	585†	623	694	585
	Business Failures (Dun & Bradstreet, number)	160†	196	221	128
	Money in Circulation (in millions of dollars)‡	$27,765	$27,833	$27,542	$28,325
	Department Store Sales (changes from like wk. a yr. ago)‡	+14%	+2%	−5%	+32%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$11,842	$17,254	$11,265	$13,682
	Federal Gross Debt (billions)	$257.0	$256.9	$257.0	$252.3
	Bond Volume, NYSE (millions)	$20.5	$21.1	$23.0	$16.7
	Stocks Sales, NYSE (thousands of shares)	7,977	7,115	8,315	7,027
	Loans and Investments (billions)†	$67.4	$67.6	$66.7	$63.141
	United States Gov't. Obligations Held (millions)†	$37,632	$37,409	$37,430	$33,455
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	156.92	156.83	152.52	151.86
	STEEL's Nonferrous Metal Composite‡	161.6	161.5	154.0	232.6
	All Commodities†	151.1	151.1	151.4	162.0
	Metals and Metal Products†	169.4	169.6	169.2	174.0
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				

Men of Industry

L. A. KARG

CHARLES L. WATERHOUSE

OLIVER L. EARL

L. A. Karg, formerly of Timken Roiler Bearing Co., has been appointed sales manager of **Tube Reducing Corp.,** Wallington, N. J. After receiving his mechanical engineering education at the University of Cincinnati, Mr. Karg became connected with Timken in the steel and tube division as service engineer, with particular application to machining problems. Subsequently, his efforts were concentrated on sales development work, with particular reference to application of tubing to the manufacture of screw machine products.

—o—

F. S. Laurie and **R. J. Williams** have been named vice presidents of **American Metal Products Co.,** Detroit. Mr. Laurie has been associated with the automotive industry 35 years. He joined American Metal in 1938 and for the last three years has been in charge of all manufacturing operations. Mr. Williams joined American Metal in 1936, and has been active in both production and sales departments. During the last three years he has been in charge of research and product development as well as acting with the sales organization.

—o—

F. M. Rich, vice president in charge of operations, **Kaiser Steel Corp.,** has moved his headquarters from Oakland to the mill at Fontana, Calif.

—o—

J. M. Wilke has been appointed general manager of sales, **Laclede Steel Co.,** St. Louis, succeeding **Walter W. Arpe,** retired. Mr. Wilke started with Laclede in 1916. Since 1945 he has been sales manager of manufacturers' products and is succeeded in that post by **Harold R. Kilpatrick,** previously St. Louis district sales manager.

Charles L. Waterhouse has been appointed to the newly created position of manager of the styling department of **Ford Motor Co.,** Dearborn, Mich. **Henry C. Grebe,** former body engineer, has been named chief body engineer. **George W. Walker,** industrial designer who was the consulting stylist in the design of the 1949 Ford, will continue as styling consultant.

—o—

Stephen H. Cross has been appointed to succeed **Lucius M. Knouse** as general manager of Stanley Electric Tools, division of **Stanley Works,** New Britain, Conn. Mr. Knouse has retired from that position, as well as from vice presidency of Stanley Works, after 46 years of service with the company. Mr. Cross, who joined the Stanley organization in 1929, has been in the electric tool division since 1930, where he handled cost accounting and other positions of responsibility. **Fred O. Fuller** was appointed sales manager of Stanley Electric Tools, succeeding **Henry W. Blackman,** retired after 20 years in that position, and 46 years with the company. **Elmer W. Ellsworth** was appointed assistant sales manager.

—o—

John M. Scott has been appointed head of the die engineering and maintenance department of **Studebaker Corp.,** South Bend, Ind., and **Arthur H. Eulitz** becomes assistant to Mr. Scott. The latter has been engaged in automotive die engineering ever since his arrival in the United States in 1923 from his native Scotland. He has been associated with a number of automobile firms in Detroit and during the war served as general superintendent for one of the large military tank producers.

Oliver L. Earl has been elected president of **Acme Aluminum Foundry Co.,** Chicago, to fill the vacancy caused by the death of **Harry L. Ferguson** early in 1949. Mr. Earl, who joined the company as vice president and director, will be succeeded in those offices by **Harold Osborne,** who retains his post as secretary-treasurer. Before joining Acme Mr. Earl was general sales manager of Mullins Mfg. Corp., with which he was connected for more than 18 years.

—o—

Oliver W. Johnson, contracting engineer, fabricated steel construction division, **Bethlehem Steel Co.,** Bethlehem, Pa., has been appointed manager of sales, plate construction, in the same division. He succeeds **Bruce P. McDaniel,** retired after more than 20 years with Bethlehem. At the same time the company announces retirement of **Harry B. Thorn,** contracting engineer in fabricated steel construction.

—o—

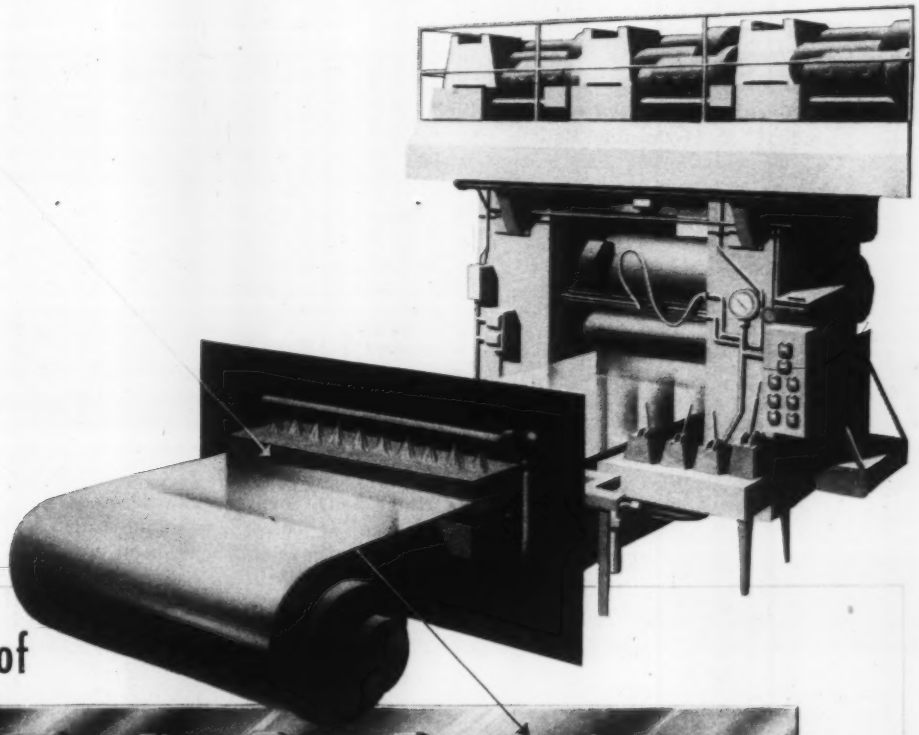
C. Mason Gerhart, assistant to the commercial sales manager, **York Corp.,** at Houston, has been transferred to the home office at York, Pa., as a sales engineer.

—o—

Greer Steel Co., Dover, O., announces election of officers as follows: **Mrs. H. C. Greer,** president; **R. A. Raese,** executive vice president; **W. E. Zimmerman,** vice president and general manager; **H. R. Walter,** treasurer; and **L. N. Douglass,** secretary.

—o—

Allied Products Corp., Detroit, announces appointment of **Frank H. Bishop** as an assistant to the president. He has had 22 years of association with General Electric Co.,



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GULF INDUSTRIAL LUBRICATION

his latest position being vice president and general manager of Tungsten Mining Corp., which is partly owned by General Electric.

—o—

Ernest A. Berglund has been elected vice president of **Hydraulic Equipment Co.**, Cleveland. He has been

ERNEST A. BERGLUND

active in the industrial hydraulics field for many years, and before joining Hydreco was manager of the hydraulics division, Commercial Shearing & Stamping Co. Mr. Berglund will devote his attention to marketing and sales development.

—o—

American Standards Association Inc., New York, announces election of three new members to its board of directors, effective Jan. 1, for a term of three years. **Maurice Stanley,** chairman of the board, Fafnir Bearing Co., represents the Anti-Friction Bearing Manufacturers Association Inc.; **B. S. Voorhees,** vice president, New York Central System, represents the Association of American Railroads; and **Col. J. G. Vincent,** executive vice president, Packard Motor Car Co., represents the Automobile Manufacturers Association. In addition, **E. E. Potter,** vice president, General Electric Co., has been named by National Electrical Manufacturers Association to fill out the unexpired term of **Clarence L. Collens,** retired as chairman of the Reliance Electric & Engineering Co.

—o—

J. Edward Goss, industrial activities administrator, **Brown & Sharpe Mfg. Co.,** Providence, R. I., has been reappointed to the chairmanship of the Apprentice Training Standards Committee of the National Machine Tool Builders' Association.

—o—

W. B. Shirk has been made director of industrial products engineering in the newly formed product development and product engineering section of **Gulf Oil Corp.,** Pittsburgh. His new appointment places him in supervision of application of fuels and lubricants to prime movers and industrial plants.

—o—

Lionel A. Forsyth of Montreal was elected president of **Dominion Steel & Coal Corp.,** its subsidiaries and associated companies. He succeeds **C. B. Lang** of Montreal, who becomes chairman of the board.

—o—

Woodrow W. Oliver has been appointed assistant purchasing agent for the eastern district of **American Steel & Wire Co.,** with headquarters in Worcester, Mass.

—o—

G. Rider Neff, former vice president in charge of sales, Cleveland Cap Screw Co., Cleveland, has been appointed manufacturers' agent for

G. RIDER NEFF

Rockford Screw Products Co., Rockford, Ill., and General Hardware Co., Milwaukee, with offices at 2917 Prospect Ave., Cleveland. The name of the agency will be **G. Rider Neff & Associates.** Mr. Neff has a background of 20 years in the industrial fastener and hardware field. His career started with Lamson & Sessions Co., Cleveland, in 1928.

—o—

Link-Belt Co., Chicago, announces the following changes in plant management personnel: **Richard E. Whinrey,** now assistant general manager at the Dodge plant, Indianapolis, will, on May 1, 1950, assume the duties of assistant general manager at the Ewart plant, Indianapolis. **Raymond S. Wood,** general manager at the Minneapolis plant, will transfer to Indianapolis Feb. 1 to become assistant general manager at the Dodge plant, replacing Mr. Whinrey. **Leslie J. Carson,** formerly chief engineer at San Francisco and at precent chief engineer at the Caldwell plant in Chicago, will move to Minneapolis Jan. 15 to assume the position of general manager of the Minneapolis plant and the north central sales division. **William P. Ridsdale,** who has been chief engineer at Dallas and Houston since 1946, and formerly a member of both the engineering and sales departments at Caldwell, has returned to Chicago to become chief engineer of the Caldwell plant.

—o—

Harold L. Miller, production manager, **Schlegel Mfg. Co.,** Rochester, N. Y., since 1933, has been named general manager of the company's Canadian plant at Oakville, Ont., succeeding **Roy Caryl.**

—o—

Paul H. Clarke has been appointed direct representative in the Cleveland area for **Hynes Steel Products Co.** and **Roll Formed Products Co.,** Youngstown.

—o—

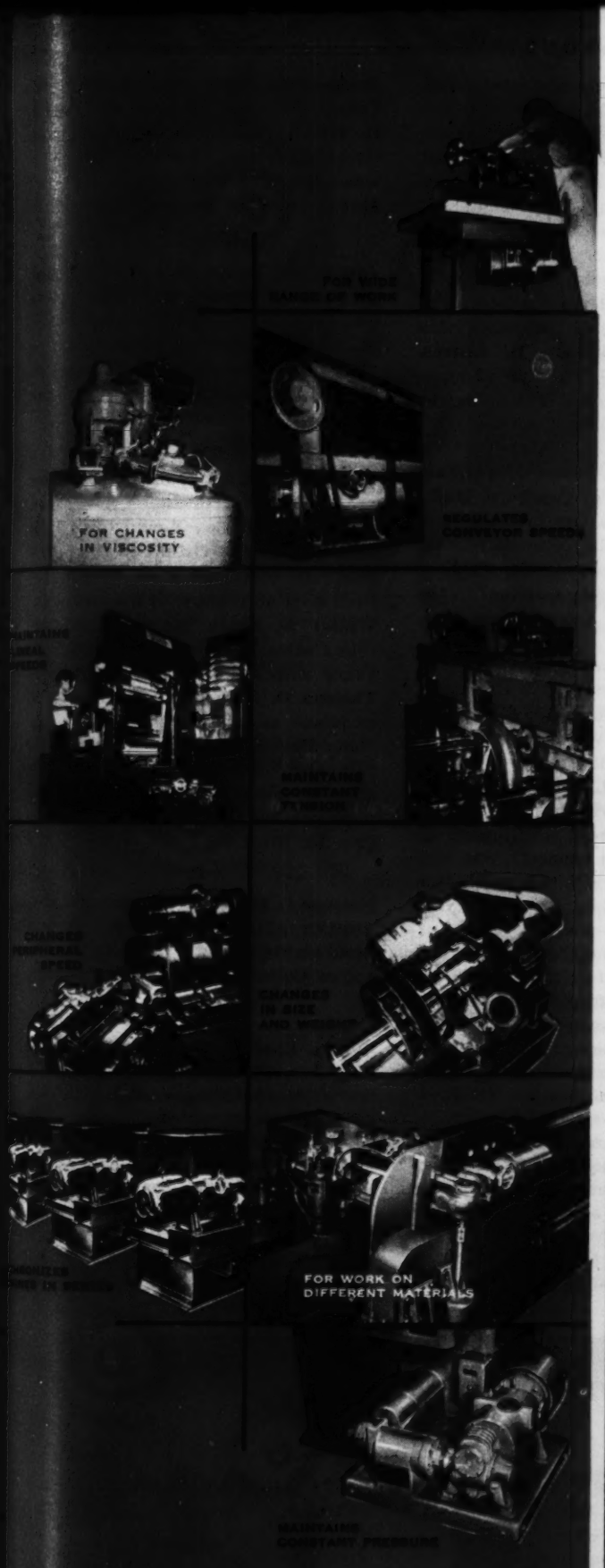
Robert A. Anderson has been appointed vice president and works manager of the Kalamazoo, Mich., plant, **Ingersoll Steel Division,** Borg-Warner Corp., Chicago. He had been associated with the division for 18 years when, late in 1948, he left to operate as a sales representative for Ingram-Richardson Mfg. Co., Beaver Falls, Pa. At the time he left Mr. Anderson was manager of Ingersoll's contract sales for the Chicago and Kalamazoo plants.

—o—

Robert T. Pring has been appointed technical director of the dust and fume division of **American Wheelabrator & Equipment Corp.,** Mishawaka, Ind. He joined Utah Copper

ROBERT T. PRING

Co. in 1936 as industrial hygienist and in 1940 became chief chemist but continued to serve in a consulting capacity on all matters relating to in-



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dustrial hygiene. When Utah Copper became a division of Kennecott Copper Corp., Mr. Pring remained with the company. In 1947 he became director of the industrial hygiene department, the position from which he has resigned to join American Wheelabrator.

—o—

Northwestern Steel & Wire Co., Sterling, Ill., announces that **A. B. Sloan** has retired as vice president in charge of sales but will continue to represent the company on a part time basis. Active management of sales will be taken over by **J. R. Hill,** appointed general sales manager, and who has been in the sales department of the company for the last 17 years, and Messrs. **J. R. Kay** and **G. W. Bulmer,** recently appointed assistant sales managers.

—o—

Exolon Co., Tonawanda, N. Y., announces election of **Lucius E. Thayer** as president, succeeding the late **W. A. Harty. Earl L. Hauman** has been named first vice president and will be general manager.

—o—

Herbert J. Cooper has been appointed assistant to the general manager, **Cooper Alloy Foundry Co.,** Hillside, N. J. Prior to joining Cooper Alloy, Mr. Cooper was employed at Bethlehem Steel Corp., and until his recent appointment as assistant to the general manager, was engaged in practical research in development of centrifugal casting and oxygen injection techniques.

—o—

R. L. Van Alstyne has been appointed manager of all scale factories of **Fairbanks, Morse & Co.,** Chicago. His duties include the administration of the new scale development and research department as well as supervision of both the St. Johnsbury, Vt., and East Moline, Ill., scale factories.

Hugh J. Ferry has been elected president of **Packard Motor Car Co.,** Detroit. He has served with the company for nearly 40 years, and for the past three months has been executive vice president, pending retirement of **George T. Christopher,** president. Since 1928 Mr. Ferry has been treasurer, a post in which he will continue. **Col. J. G. Vincent,** vice president of engineering, becomes executive vice president, and **William H. Graves,** vice president and director of engineering, continues as administrative head of the engineering division.

—o—

Irving A. Duffy, director of purchasing, **Ford Motor Co.,** Dearborn, Mich., has been elected a vice president and member of the policy committee. He joined Ford in February, 1949, prior to which time he was assistant to the vice president of International Harvester Co.

—o—

Trundle Engineering Co., Cleveland, announces that **Creed W. Fulton** has been elected a vice president and named manager of its New York office, and **Harry L. Wood,** vice president of the Trundle organization since 1941, will head its Chicago office. Mr. Fulton formerly was vice president, Samuel J. Creswell Iron Works, Philadelphia.

—o—

E. A. Trask, former head of the San Francisco office of **John A. Roebling's Sons Co.** of California, has assumed new duties as manager of sales of the company's Chicago branch. **G. C. Bukowsky,** former manager, Portland, Oreg., branch, succeeds Mr. Trask.

—o—

Eugene L. O'Meara has been appointed purchasing agent of **Harbison-Walker Refractories Co.,** Pittsburgh. With Harbison-Walker since 1928, Mr. O'Meara has served for many years in both the sales and construction divisions of the company's engineering department.

Bridgeport Brass Co., Bridgeport, Conn., announces addition of **Donald H. Waddington** to the sales staff of its Atlanta office. For many years he was associated with American Radiator & Standard Sanitary Corp.

—o—

Joseph F. Taylor has been elected president of **Bausch & Lomb Optical Co.,** Rochester, N. Y., succeeding **M. Herbert Eisenhart,** who becomes chairman of the board. **William W. McQuilkin,** assistant treasurer, has been elected treasurer.

—o—

Myron S. Curtis, manager of sales promotion department, **Youngstown Sheet & Tube Co.,** Youngstown, has been appointed assistant to the president, succeeding **Roy M. Welch,** retired after 48 years with the company. **Walter E. Scott,** manager of flat-rolled sales, has also retired after 43 years' association with the company. **Thomas D. Hess** has been appointed assistant superintendent of the Indiana Harbor works' open hearth department. He recently was assistant superintendent, open hearth department, at the Midland, Pa., plant of Crucible Steel Co.

—o—

Norman L. Harvey has been appointed director of engineering, and **Robert MacLatchie,** director of manufacturing of **Colonial Radio Corp.,** Buffalo.

—o—

Walter E. McArthur, eastern regional manager, Nelson Stud Welding Division, **Morton Gregory Corp.,** Lorain, O., has been appointed manager of industrial sales, a newly created position which will co-ordinate stud welding sales and engineering service to large national firms having engineering and purchasing departments in various locations. Mr. McArthur will have his office at the Nelson headquarters in Lorain.

R. L. VAN ALSTYNE

EUGENE L. O'MEARA

WALTER E. McARTHUR

H. M. RICH Jr.

H. M. Rich Jr. has been appointed general sales manager, Electro Metallurgical Division, **Union Carbide & Carbon Corp.**, New York. He joined the corporation in 1942 after ten years with Hickman, Williams & Co. in Detroit.

—o—

Dr. John A. Hutcheson has been elected a vice president, **Westinghouse Electric Corp.**, Pittsburgh. He has been director, Westinghouse research laboratories, and will continue at that post.

—o—

John J. Byrne has been appointed manager of national accounts, southern division, **Mack-International Motor Truck Corp.**, with headquarters in Atlanta.

—o—

Clark Hopkins has joined **Paulsen-Webber Cordage Corp.**, New York, as sales representative in the industrial field. He had former association with C. R. Daniels Co., Chicago, and Goodyear Rubber Co.

—o—

Ralph J. Tate has been elected president, **Camillus Cutlery Co.**, Syracuse, N. Y., succeeding **G. F. Lewis,** resigned. Mr. Tate formerly was a vice president of the firm.

—o—

Bruce S. Williams, formerly manager of the southeast territory, belting division, **Russell Mfg. Co.,** Middletown, Conn., has been appointed assistant to the president.

—o—

C. Stewart Ferguson, engineering manager, chemicals division of **General Electric Co.'s** chemical department, Pittsfield, Mass., has been appointed West Coast manager of that division, with headquarters at the Anaheim, Calif., plant. He is succeeded as engineering manager by **Paul F. Preston,** who also continues as manufacturing manager of the division.

K. W. HORSMAN

K. W. Horsman has been appointed works manager of the Dunellen, N. J., Works of **Worthington Pump & Machinery Corp.** to succeed **B. R. McBath,** resigned.

—o—

A. B. Agnew, vice president in charge of operations, **Laclede-Christy Co.,** St. Louis, has been elected a director of the company.

—o—

A. R. Edwards, E. J. Goldschmidt Jr. and **John Molloy** have been elected vice presidents of **Armco International Corp.,** subsidiary of Armco Steel Corp., Middletown, O., which handles all of the parent company's export sales and provides technical services and operating counsel to foreign steel companies. Mr. Edwards, who joined Armco in 1922, has been director of distribution for the subsidiary since 1944. Mr. Goldschmidt joined Armco in 1917, and in 1945 was made director of finance and administrative assistant of Armco International. Mr. Molloy joined Armco in 1923, and since 1945 has been director of the subsidiary company's technical division.

—o—

John D. Smetzer, former industrial relations director for **Weatherhead Co.,** Cleveland, has been appointed vice president in charge of industrial relations. **John D. Baldwin Jr.** has been made chief engineer and will supervise all development and product engineering activities of the company.

—o—

Ray J. Miller has been named manager of the research engineering department of **Dearborn Motors Corp.,** Detroit, national marketing organization for the Ford tractor and Dearborn farm equipment. He will be a staff member of the engineering and manufacturing division headed by **Ralph E. Hunt.**

J. E. SIMONIN

J. E. Simonin has been appointed works manager of the Allenport plant of **Pittsburgh Steel Co.,** Pittsburgh. He has been employed at the Allenport plant for 20 years, and for the last 11 years has served as plant metallurgist.

—o—

Harold Duncan has been promoted to assistant regional manager, **Eutectic Welding Alloys Corp.,** New York. Formerly district engineer in Texas, Mr. Duncan will be in charge of a group of Eutectic district engineers, servicing users of Eutectic products throughout the Southwest.

—o—

National advertising program of **Walker-Turner Division,** Kearney & Trecker Corp., Plainfield, N. J., will be handled by Horton-Noyes Co., Providence, R. I. **H. B. Burnett** will be account executive contacting the account. **W. J. Antener,** who formerly handled this account as agency, has been appointed advertising and sales promotion manager.

—o—

Reginald C. Cushing has been appointed San Francisco area branch manager for **Minneapolis-Honeywell Regulator Co.** He formerly was regional sales manager of the air conditioning controls division. **C. L. Peterson,** Pacific sales manager, has been transferred from San Francisco to Chicago, where he becomes office manager. He is succeeded in San Francisco by **Gavin S. Younkin,** Los Angeles branch manager.

—o—

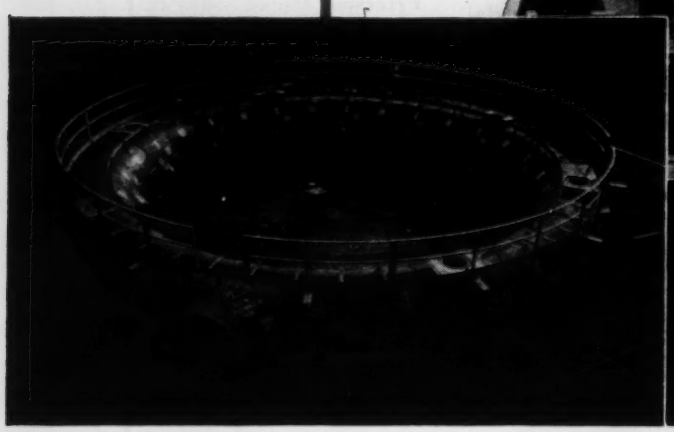
Leo S. Ohman has been elected to the newly created position of vice president in charge of manufacturing for **Hannifin Corp.,** Chicago. He joined Hannifin in 1948 as factory manager after serving as chief industrial engineer for Brown Instrument Co., Philadelphia, and later for Chefford Master Mfg. Co. Inc., Fairfield, Ill.

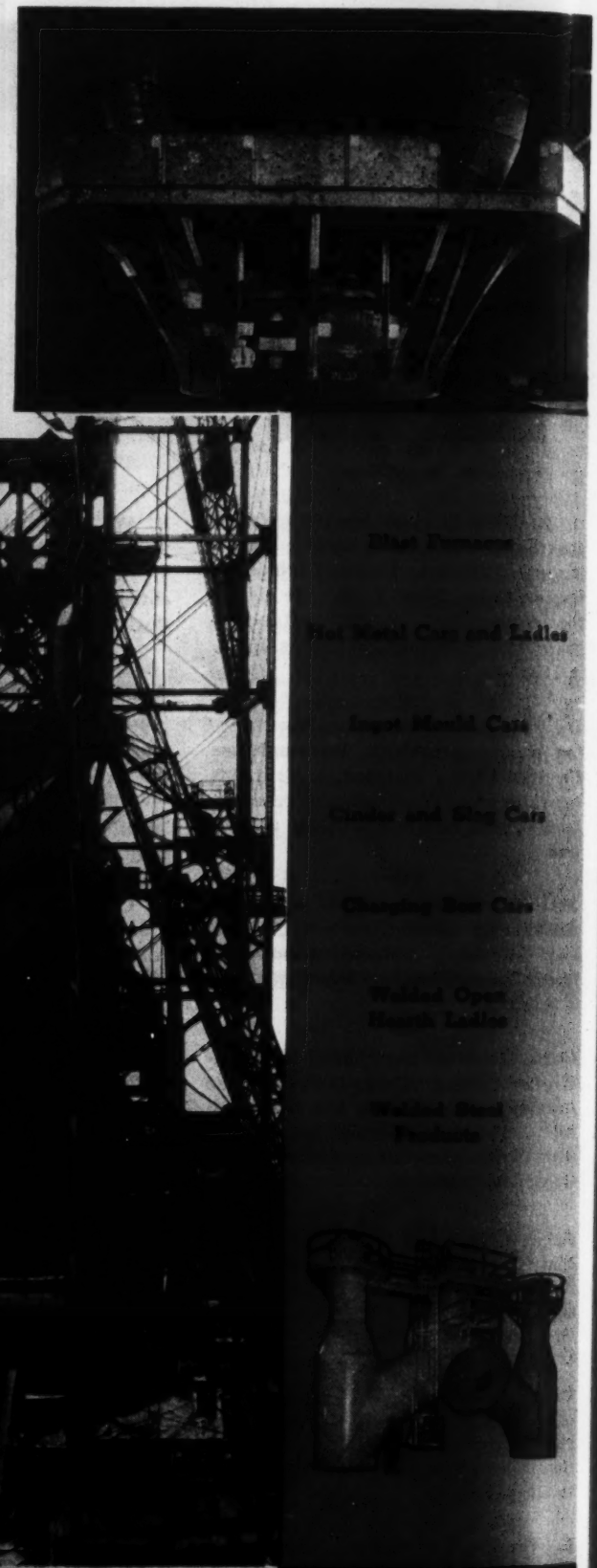
from TOP to BOTTOM

POLLOCK gives you precision fitting in all steel plate construction work

Let Pollock handle your next steel plate fabrication and erection job, for Pollock skilled experts have had years of experience . . . can give you precision fitting every time! Before leaving the shop, all parts are assembled and carefully match-marked to insure close, accurate fits and speedy erection in the field. So carefully is this done that one customer — 12,000 miles away has ordered steel work from Pollock **three** times, and each time was able to do his assembling quickly and easily. In another instance, the Pollock Company tore down and rebuilt the steel work for an **entire** blast furnace which was out of operation only 83 days, setting a new world record and saving over 70,000 tons of pig iron.

You, too, can benefit from Pollock's broad experience . . . its complete facilities and well-trained engineering-designing staffs. Whatever your fabricating job — large or small — heavy or light — put it up to Pollock and see how you save!





The WILLIAM B. POLLOCK CO.

YOUNGSTOWN, OHIO

STEEL PLATE CONSTRUCTION

ENGINEERS FABRICATORS ERECTORS

Production AND Engineering NEWS AT A GLANCE

TOOL FAILURES SUDDEN—Despite high copper content of silicon aluminum bronze, it is harder and tougher than other copper-base alloys, and requires special care in machining. According to Bridgeport Brass Co., Bridgeport, Conn., sharp cutting tools are essential in machining the metal. Tools do not gradually become dull on this material but fail within a few minutes after first indication of wear. Furthermore, it is essential that the dwell cycle be cut to absolute minimum due to friction. Tool life is increased greatly if tools are withdrawn as soon as they stop cutting.

STANDARDS TECHNIQUE SEMINAR—Another private five-day seminar on principles and technique of organizing company standardization work, and formulation of standard specifications will be held by Dr. John Gaillard, mechanical engineer on the staff of American Standards Association, New York. The meeting is scheduled for Jan. 23-27 at the Engineering Societies Building, New York. Ten conferences are planned each to be followed by round-table discussion.

STAMPING PRESS HAVEN—Today's new cars require more body parts than prewar and use more heavy-gage steel. As a result the automotive industry's press shops have been revamped considerably in the last few years. The larger number of stampings per car also call for more die making. For example, one auto company uses an average of 1200 dies for each of its various makes of cars, or approximately 300 more dies per car than before the war.

CONTROLS STRAY CURRENTS—Better television performance may be expected as increasing use of lead is made in the manufacture of glass for image tubes. According to Lead Industries Association, some of the glass made for this purpose by American Structural Products Co., Columbus, O., contains as much as 30 per cent lead by weight. The metal, besides giving the tube a high light dispersion characteristic, enables the glass unit to withstand safely the terrific surge of 8 to 12,000 volts which the ion gun shoots at the screen in form of electronic particles. Electrical resistivity of the leaded glass prevents any current in one part of the tube from causing harmful disturbances in another part.

NO UNION INTERFERENCE—To be a certified scraper in Switzerland—one who scrapes machined surfaces—an individual must serve a six-year apprenticeship without pay, pass a government test, then spend four years as a helper under direction of an experienced scraper. Without a government "diploma" a man cannot qualify for membership in that select group of precision machinists and command the accompanying compensations.

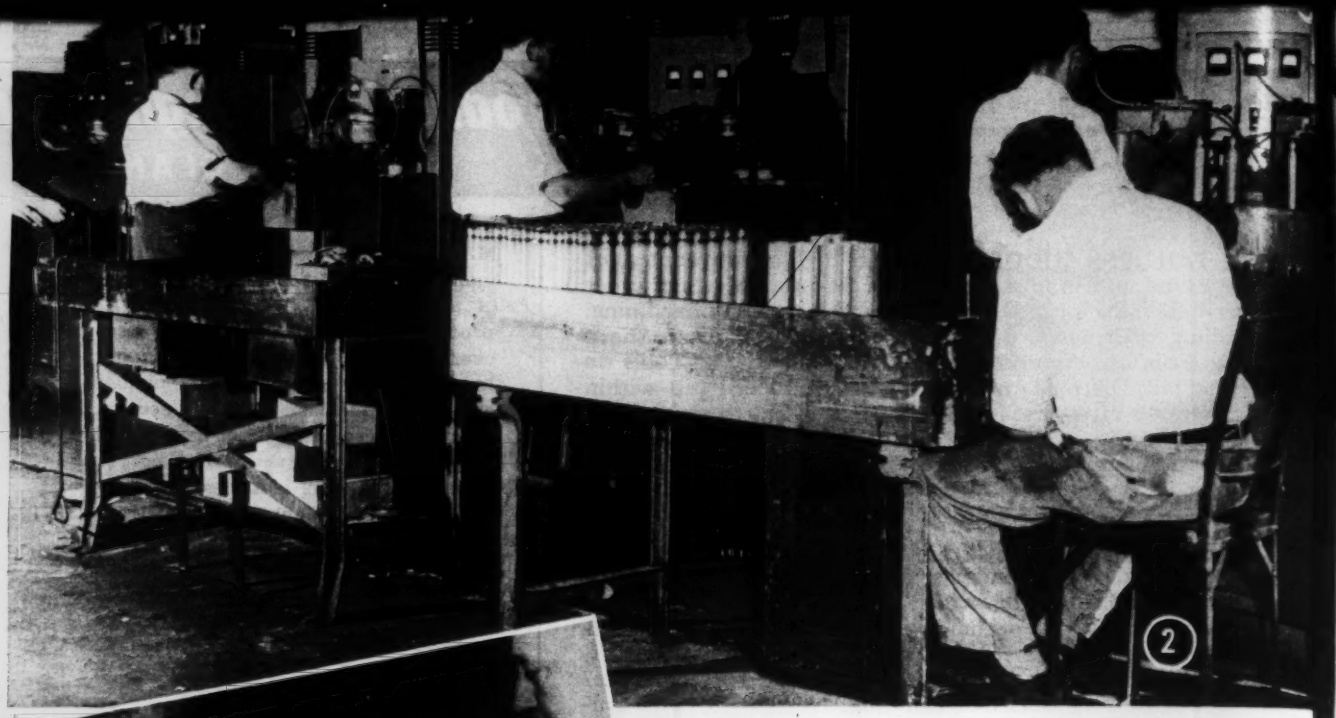
STEPPING-UP NOTCH—Notching a twist drill sometimes does more than dull the cutting tool. Westinghouse Electric Corp., Pittsburgh, which operates a "know-how" lab to develop new techniques, discovered that by notching a drill holes in metals can be "pushed" through ten times faster than formerly. Other developments in various stages of refinement include a method of painting with molten steel, cutting brass with abrasive rubber wheels that look like giant typewriter erasers and a method of welding long steel I-beams in about one-fifth the time ordinarily required.

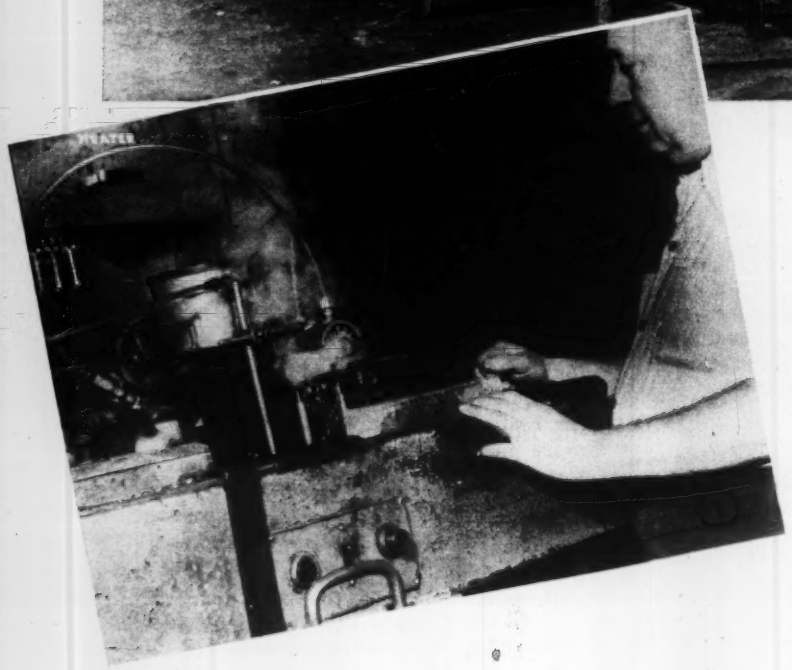
MASS HARDENING—An accounting machine is almost literally composed of as many parts as the figures it produces. Typical unit comprises over 7000 individual parts, including levers, gears, dogs, ratchets, pinions etc., not to mention nuts and screws. Many of these small steel parts must be given a selective hardening for maximum wearing qualities. At Burroughs Adding Machine Co., Detroit, racks accommodating a row of pieces which may be heated and quenched simultaneously are devised to greatly speed the operation. Parts are treated in batches of 50 or more on a single unit to provide an hourly production of 20,000. (p. 46)

MATTER OF SHAPE—In producing permanent magnets, the shape of each unit must be such that it will produce or help produce a magnetic field of specified intensity in a given air gap when magnetized and in use. The design limitations, it is pointed out, are often proportional to the variety of alloys that can be used for casting purposes. In this connection, it is well worth noting that the best materials are not invariably those metals which will retain the strongest magnetic charge. (p. 48)

TOOLING FLEXIBILITY—To meet any changes in model designs, an engineer should design tools so that with minor changes the equipment can be used efficiently to machine other parts. Such a policy promotes mass production. For example, at Hercules Motors Corp., Canton, O., connecting rod fixtures are arranged on the machine table so that the operator is unloading and loading one fixture while cutters are machining connecting rods in a second fixture. Both fixtures are designed to handle four other connecting rods similar in design but varying in size. (p. 54)

STUMBLED-ON TECHNIQUE—Flash coating wire prior to wet drawing is one of the many practices in industry stumbled upon by sheer chance. It seems that about 100 years ago, a foreman who had to quench hot ingots of brass, and also to heat up a tub of acid, decided to make one job cancel out the other by quenching in the acid tub. He found eventually that wire pickled in that tub drew nicely with a pleasing coppery color. (p. 66)





ELECTRONIC

. . . affords flexibility,

By A. H. ALLEN
Detroit Editor, STEEL

Photography by Dan Reebel

PRECISION processing of literally hundreds of millions of metal parts annually, required in the construction of various types of business machines, and at the same time retaining the desired degree of flexibility to shift operations from one part to another, has called for considerable ingenuity in the selection and layout of production equipment at the Burroughs Adding Machine Co., Detroit.

Among the varieties of machines built are units for adding and subtracting, desk bookkeeping, calculating, typewriter-accounting, statistical, billing, and cash registering functions. A typical accounting machine, for example, comprises over 7000 individual parts, including levers, gears, dogs, ratchets, pinions, pins, slides, keys, rods, frames, cases, not to mention a broad assortment of nuts, screws and other fasteners. Some individual parts are made in quantities exceeding 10 million per year.

Progressive improvement of plant equipment and materials handling methods has been going forward in recent years. Last year a total of $5,936,000 was spent for new tools and equipment, covering the improvement of manufacturing methods and working conditions, replacement of obsolete tools and provision of new tools, dies, jigs and fixtures. Installation of twelve new multiple-spindle screw machines has boosted efficiency by two-thirds over the former single-spindle machines used on the same jobs. One entire floor was added to the plant for conversion of paint finishing operations to the electrostatic method, bringing a 50 per cent reduction in both processing time and paint consumption.

Wearing Quality Increased—Many of the small steel parts required in the machine construction must be given a selective hardening treatment for maximum wearing qualities. To expedite this work and to provide a high degree of flexibility, speed, cleanliness and economy, four tube-type General Electric 15-kilowatt induction heating units were installed, and are in continuous operation. This type of induction heater uses an oscillator tube to convert ordinary plant

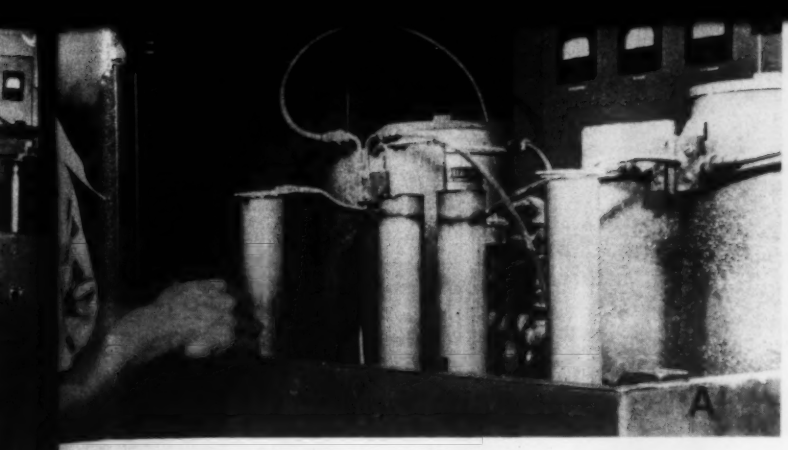


Fig. 1—Localized hardening of this small hollow steel shaft is accomplished in a matter of seconds. Heating and quenching cycle is completely automatic, the quench here just having started. Other sizes and shapes of parts are handled by simply changing the heating coil and quenching fixture, hundreds of which have been designed

Fig. 2—Four electronic heating units used principally for selective hardening of small parts, either singly or in batches on rods and racks. Unit at right has been adapted for silver soldering tops on cylindrical adjusting mechanisms for swivel chairs, a group of which is seen on table in foreground

Fig. 3—Small pieces of silver soldering wire, dipped in the pan of flux in front of operator, are placed around the joint between the end disk and cylindrical housing before the assembly is placed under the heating coil and the soldering operation effected

SELECTIVE HARDENING

speed, cleanliness and economy

Hundreds of heating coils are used which may be quickly plugged into the electronic heater, depending on the job involved. Some coils are combined with a suitable type quenching fixture which becomes operative after the piece has come to heat

power to the 510,000-540,000 cycle frequency needed for heating. The high-frequency current passes through a water-cooled coil of copper tubing shaped to envelop, but not touch, the part or group of parts being treated. Hundreds of different sizes and shapes of coils are available, any one of which may be plugged into the heater in a matter of minutes, depending upon the type of job involved. Where necessary, the heating coil is combined with a suitable type of quenching fixture, so that as soon as the part has come to heat, current is cut off through the action of a timer and water pressure admitted to the quenching fixture.

General view of the four heaters is shown in Fig. 2, which indicates the minimum space requirements for the equipment, each machine being completely self-contained in its sheet steel cabinet. Fig. 1 presents a closeup of a localized hardening operation on a small hollow shaft. At the moment of exposure, the quench had just come on, partially obscuring the shape of the heater coil just above the part, although its U-shaped end can be discerned. Most heating coils and quenching fixtures used are so simple that they are made in the company's heat treating department to suit requirements. After installation of the first machine, its flexibility and utility proved so popular, and fixture operators so ingenious at adapting new parts to the electric treatment, that hundreds of additional parts were switched from lead pot or furnace treatment to the electronic system, necessitating addition of three more machines.

Racks Speed Up Operation—In hardening small parts it is readily possible to devise racks accommodating a row of pieces which may be heated and quenched simultaneously, greatly speeding up the operation and facilitating handling. It is reported that where parts can be so treated in batches of 50 or more, as many as 20,000 can be hardened hourly on a single unit.

Illustrative of the wide adaptability of the electronic equipment is its adaptation to a silver soldering or brazing operation on an assembly for the adjusting mechanism of a recently-designed secretary's chair which the company (*Please turn to Page* 64)

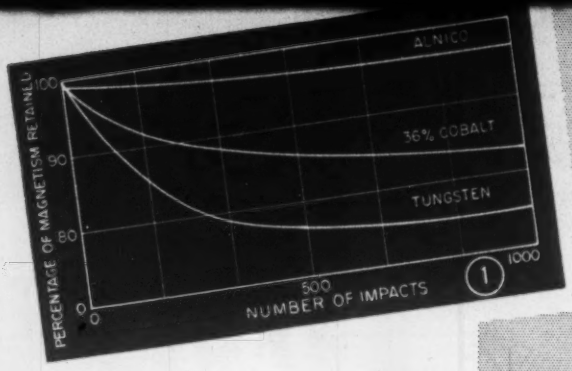


Fig. 1—Vibration resistance

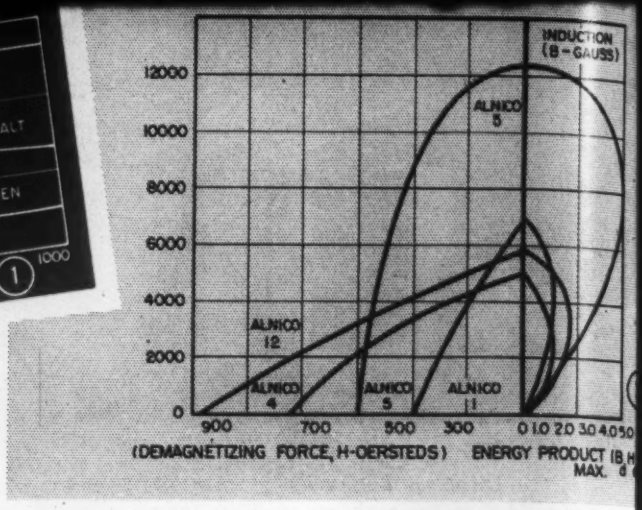


Fig. 2 — Demagnetization and energy curves

Fig. 3—Resistance to effects of stray fields

Fig. 4 — Hysteresis loop for permanent magnetic alloy

Fig. 5—Resistance to effects of heating

Casting Alloys for P

By THOMAS A. DICKINSON

COMPARED with other metal-casting techniques, the casting of alloys for permanent magnets is distinguished by the fact that the finished castings often should have a strained crystal lattice or coarse granular structure—a characteristic normally considered undesirable. This feature permits a cast material to retain a strong magnetic field for a long period of time; and, while actual particle sizes are usually varied in magnets for different applications, it definitely limits the number of casting designs that are practical for ferromagnetic alloys.

For example: Adjacent thick and thin sections must usually be avoided to prevent cracks which will minimize a magnet's usefulness. Close dimensional tolerances should normally be regarded as economically impractical, since the coarse-grained castings must often be finished by grinding. The magnet must be dimensioned and proportioned so that it can be readily magnetized in a strong electromagnetic field, usually produced by a solenoid. Shape of the magnet must be such that it will produce or help produce a magnetic field of specified intensity in a given air gap when it is magnetized and in use.

Design Limitations—Extent of these design limitations is often proportional to the variety of alloys that can be used for casting purposes; in this connection, it is well worth noting that the best materials are not invariably those metals which will retain the strongest magnetic charge. Accompanying tables denote compositions and properties of the alloys which are now most commonly used to make cast permanent magnets. Among the latter alloys, Alnico (a name coined from aluminum-nickel-cobalt) materials are newest, most numerous, and comparatively versatile. Quenched carbon steels have become almost obsolete as magnet-casting alloys since the early 1900s. Chromium, tungsten, and cobalt steels are currently preferred where special nonmagnetic physical properties are mandatory, since the Alnicos do not have high mechanical strength.

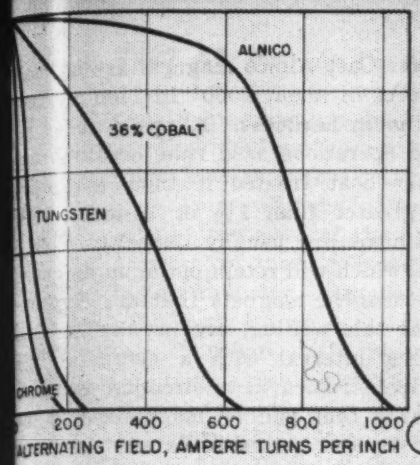
Virtually all magnet-casting work is accomplished with sand molds. However, very small magnets have been accurately produced by investment casting and it is entirely possible that lower unit costs can eventually be realized through the production of standardized magnet shapes with die-casting equipment—thanks to the current development of better temperature-resistant injection cylinders and molds, plus the recent discovery that certain alloys in the low-temperature range are ferromagnetic.

Green Sand Molds—A considerable number of foundries use green sand molds in casting ferromagnetic metals, due to the aforementioned need for coarse grain. However, a number of specialized producers such as Arnold Engineering Co., Chicago, prefer dry sand molds where it is necessary to maintain nominal dimensions without excessive grinding. The latter company makes almost exclusive use of Alnico alloys, and its engineering personnel aver that their use of dry sand molds ordinarily permits the following "as cast" tolerances:

Dimension	Tolerance
Up to 2 inches	±1/64-inch
2 to 4 inches	±1/32-inch
4 to 6 inches	±3/64-inch

For dimensions of more than 6 inches, the above tolerances are reportedly increased by 1/64-inch for each 2-inch dimensional increase.

The Arnold dry-sand casting process has been officially described as follows: "Holes for fastening purposes are cored in the magnet with sand or graphite rods. Whether sand or graphite cores are used depends on the size, length, tolerance and smoothness required for a given hole. Graphite rods are somewhat stronger than sand rods and will resist the erosive action of the cast metal; hence, they are used where holes must be very small, very long, or very smooth. Sand cores produce a comparatively rough finish, but will usually maintain tolerances of about plus or minus 0.015-inch per inch diameter (i.e.,



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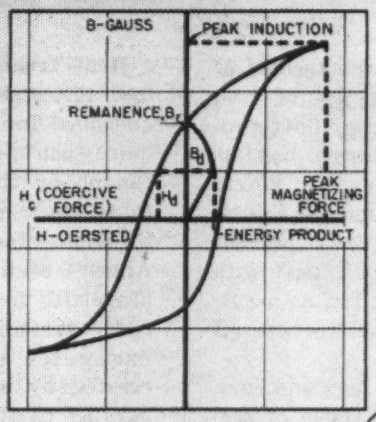

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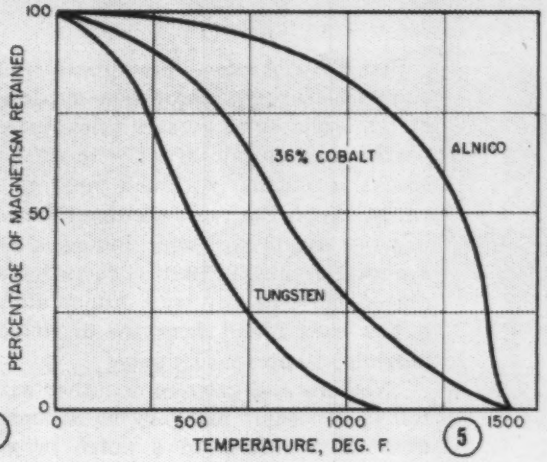


5

Permanent Magnets

Microstructure of finished castings permits retention of a strong magnetic field for a long time, but limits number of practical casting designs

where the plus or minus 0.005-inch per inch tolerances of commercial graphite cores are nonrequisite). Hole tolerances of less than plus or minus 0.005-inch per inch diameter have been maintained, when necessary, with precision-ground graphite and precision-molded sand cores.

Distance Between Holes—"Tolerances governing the distance between two or more holes in a casting are plus or minus 1/64-inch from 0 to 1 inch, plus or minus 1/32-inch from 1 to 3 inches, and plus or minus 3/64-inch from 3 to 5 inches. When three or more holes are required, the deviation from nominal dimension to a plane or center line may be in the neighborhood of plus or minus 1/32-inch. The dimension of a hole or other cored opening that can satisfactorily be made in a casting is a function of wall thickness for the finished casting. Loud speaker rings of 3 and 4-inch diameters and approximately 2 inches high have been cast without cracking with minimum wall thicknesses of approximately 5/16 to 3/8-inch. Smaller rings of the same or less height can be cast with a minimum wall thickness of 3/16-inch, while longer rings or cylinders require heavier walls to prevent cracks or warpage.

"Rectangular bars up to 8 inches long have been satisfactorily produced with a 1/8-inch thickness, where the other dimension was not less than 1/4-inch. Round bars with a diameter of 1/8-inch should, in general, be no longer than 4 inches because such bars are subject to warpage—both in the casting process and during subsequent heat treatments. Small round bars up to 3/8-inch diameter and rectangular bars of a comparable size and uniform cross-section can be precision cast for relative straightness and smoothness at tolerances of plus or minus 0.005-inch without eventual grinding.

TABLE I
ALNICO MAGNETIC ALLOYS*

Mfr. No.	Approximate Composition	Peak Magnetizing Force, Oer.	Peak Induction, Gauss	Remanence B_r— Gauss	Coercive Force, H_c, Oersteds	Energy Product* (B_dH_d) Max. x 10^{-6}	B_d	H_d
I	63% Fe, 12% Al, 20% Ni, 5% Co	2000	12500	7100	450	1.4	4600	305
II	54.5% Fe, 10% Al, 17% Ni, 12.5% Co, 6% Cu	2000	12900	7300	530	1.55	4620	335
III	63% Fe, 12% Al, 25% Ni	2000	12000	7000	470	1.4	4300	325
IV	55% Fe, 12% Al, 28% Ni, 5% Co	3000	11600	5200	750	1.25	3000	415
V	51% Fe, 8% Al, 14% Ni, 24% Co, 3% Cu	3000	16500	12500	600	4.5	9680	465
XII	33% Fe, 6% Al, 18% Ni, 35% Co, 8% Ti	4000	13200	5800	950	1.75	3100	565

*Products of Allegheny Ludlum Steel Corp. Actual energy in ergs/cm³ may be expressed as: $\frac{\text{Energy Product}}{8\pi}$

TABLE II
PHYSICAL PROPERTIES

Alloy No.	Specific Gravity	Resistivity, Microhms/ Cm^3 at 25° C.	Mean Coef. of Expansion, 20-300° C.	Tensile Strength, psi	Transverse Mod. of Rupture, Lbs.
Alnico I	6.9	75	12.6	4197	13973
Alnico II	7.1	65	12.4	3080	7230
Alnico III	6.9	60	13.0	12386	22510
Alnico IV	6.97	75	13.1	9174	24483
Alnico V	7.3	47	11.3	5456	10826

Flat Plate Areas—"Flat plates with thicknesses of about ⅛-inch are cast for a maximum area of 1 sq in. while plates of greater thicknesses may have proportionately larger areas without acquiring hairline cracks (particularly around cored holes) . . . . Where variations in the cross-sectional dimensions of a casting are required, large radius fillets may prevent eventual cracks. Sharp corners have been cast with reasonable accuracy with Alnico alloys, but as a rule it has been found desirable to round all corners (if possible) to prevent chipping.

"Notches and grooves, together with lugs and ears, fall in the same category as abrupt changes of section. The bottom of a notch or groove should be rounded to prevent high stress concentrations, and lugs or ears should be dimensioned so as to minimize the possibility that they will be chipped or broken off. Slots which are to be used to accommodate fastening screws, as in meter magnets, are best cast if a 1-degree draft is allowed on the sides of each slot and should be no narrower than ⅛-inch unless it is desirable to clean the slots during a final grinding operation.

"One of the frequently attempted methods of fastening Alnico magnets to adjacent structures has been to use cast-in iron or stainless steel inserts, which may later be ground flush with the castings and drilled or tapped to receive screws or related assembly components. This is not a recommended practice whenever it is possible to use any other method of assembly because metallurgical examinations will usually reveal many hairline cracks around the inserts due to abnormal shrinkage. These cracks will be enlarged by following heat treatments, and may cause an ultimate failure if a magnet is exposed to vibrations or slightly-excessive loads. . . . Where inserts are specified, wall thicknesses around the inserts should be at least equal to and preferably twice the diameter of each insert; and, even then, cracks must be anticipated."

Heat Treatment—Cast Alnico magnets are normalized at temperatures of about 2000° to 2400° F. and quenched for optimum hardness. Alloys 3 and 4 require fast-quench operations as a rule, because they cannot be further heat treated if their respective thicknesses are greater than 1½ or ¾-inch, while the remaining Alnicos are usually quenched slowly. Alnico 5 castings, which will retain optimum magnetic properties for permanent magnets that are commercially available at this writing, are usually stressed during the cooling interval with a magnetic field created by multipole rotors in a direction which is parallel to the axes that will be magnetized in the finished casting. Special stressing fixtures are used in connection with horseshoes and other shapes with "bent" axes; but not with bars, rings or shapes with straight-line magnetic axes.

Final heat treatments for Alnico alloys, where practical, can be generally described as drawing operations at temperatures of about 1000° F. Thereafter, castings can be finished to tolerances of as little as plus or minus 0.0005-inch by grinding. Closer tolerances have been maintained by lapping or honing, but only at increased production costs.

In several western foundries, where magnetic alloys are cast in green sand molds, metal-spray equipment is used to repair small pits or blowholes in magnet castings. This is followed by grinding with aluminum-oxide or similar abrasives, which have a relatively soft bond.

Grinding Difficult—Generally speaking, it is more difficult to grind Alnico castings than equivalent areas of tool steel because the material is exceedingly hard and brittle. However, both internal and external grinding can be accomplished with normal production methods and standard equipment if adequate quantities of coolant are used to prevent heat-checking and if grinding pressures are light enough to prevent chipping.

Cast magnetic alloys are (*Please turn to Page 74*)

TABLE III
MAGNETIC MATERIALS
STEELS

Composition	Peak Magnetizing Force, Oersteds	Peak Induction, Gauss	Remanence, Br—Gauss	Coercive Force, Hc—Oer.	Maximum Energy Product*	B_d	H_d
1% Carbon	300	14800	8600	48	0.18	5625	32
3½% Chromium	300	13500	9200	65	0.29	6400	45
5% Tungsten	300	14500	10300	70	0.32	6900	46
17% Cobalt	1000	15000	9000	165	0.62	5900	105
36% Cobalt	1000	15500	9600	240	0.95	6150	155

*Energy product (B_dH_d) maximum x 10^{-6}. Actual energy in ergs/cm³ may be expressed as: $\frac{\text{Energy Product}}{8\pi}$

TABLE IV
MAGNETIC MATERIALS
MISCELLANEOUS

Name & Reference (U. S. Patent No.)	Approximate Composition	Remanence Br—Gauss	Coercive Force Hc—Oersteds	Energy Product* x 10^{-6} (BdHd) Max.	B_d	H_d
New KS (No. 2,105,655)	27.2% Co, 17.7% Ni, 6.7% Ti, 3.7% Al, Bal. Fe	7150	785	2.03	4150	490
Vectolite or Kato's Oxide (Nos. 1,976,230 & 2,161,926)	30% Fe_2O_3, 44% Fe_3O_4, 26% Co_2O_3 Or: 16% Ni, 12% Ti, 28% Co, 4.5% Al, Bal. Fe	1600	900	0.50	944	530
		6900	920	2.70	4500	600
Silmanal (No. 2,247,804)	86.5% Ag, 8.8% Mn, 4.7% Al	595	575	.08	....	...
Cunife (No. 2,124,607)	60% Cu, 20% Fe, 20% Ni	5600	600	1.75	4500	390
Cunico (No. 2,170,047)	45% Cu, 25% Ni, 30% Co	3400	710	.85	2020	420
Comol (No. 1,904,859)	12% Co, 15% Mo, Bal. Fe	9330	243	1.00	5900	170
Vicalloy (No. 2,190,667)	52% Co, 10% V, Bal. Fe	9000	300	1.02	5530	185

*See footnote on steels for actual-energy expression.

SEEN AND HEARD IN THE Machinery Field

By GUY HUBBARD
Machine Tool Editor

C. R. BURT AT 75: At the turn of the century there was held in Paris an international exposition in which leading American machine tool companies participated. Representing those companies were a number of young men who were destined to become prominent in the American machine tool industry.

And now at the close of the first half of the 20th century, several of those men still are prominent and active in this industry. Among them are Henry D. Sharpe, president, Brown & Sharpe Mfg. Co.; Edward P. Bullard, chairman of the board, Bullard Co.; and Clayton R. Burt, president, Potter & Johnston Co.

Youngest of these three is Mr. Burt, born at Lynn, Mass., December 17, 1874. Vermonter by adoption and "graduate" of Brown & Sharpe, he still is going strong at 75 in a new career which he began to carve out for himself when he was well past 70 years of age.

Following his graduation from Brown & Sharpe, Mr. Burt "went west" to Rockford, Ill., where he became a plant executive with Barber-Colman Co. Eventually he began to work back toward the east again, by way of important positions in Canada and in Buffalo during the period of World War I. In the meantime he had a hand in establishing Davenport Machine Tool Co. in Rochester, N. Y.

On the basis of the reputation for getting things done, which Mr. Burt has built up over the years, he was called to Hartford more than 25 years ago to carry out a sweeping program of modernization just then being launched by Pratt & Whitney division Niles-Bement-Pond Co. This entailed first the cleaning up and linking together the 37 buildings of the old plant on Capitol Avenue. Then in 1939 came the building of a completely new plant at Charter Oak Park, West Hartford, in which the company was fully installed in December, 1939, just in time to handle efficiently the rush of wartime business.

After years of distinguished service as vice president, president and chairman of the board of Pratt & Whitney division Niles-Bement-Pond (he also was president of National Machine Tool Builders' Association, 1936-37), Mr. Burt resigned in March, 1948, to become president of Potter & Johnston Co., Pawtucket, R. I. Potter & Johnston had just been taken over at that time as a wholly-owned subsidiary of Pratt & Whitney. Mr. Burt continues to make his home at 44 Orchard Road, West Hartford, but actually spends three or four days each week at the Pawtucket plant.

Throughout his long and distinguished career, Clayton R. Burt never has lost touch with the men in the shop. So it was that on Thursday night, December 15, 1949, the Pratt & Whitney foremen had him as their honored guest. The Niles-Bement-Pond officials had to wait until Friday night, December 16, to pay their respects to him on the eve of his 75th birthday.

SENSIBLE SHOW ROOM: Several times within recent months I have mentioned a growing tendency of machine tool builders to hold "private machine tool shows" within the four walls of their own plants. On December 21, 1949, I was guest of P. R. Hatch, sales director, and other officials of Brown & Sharpe Mfg. Co., at such a showing at Providence.

The interesting thing about the Brown & Sharpe demonstration was that it is part of a "continuous performance" which is staged at any time when prospects and customers visit the plant—which is practically every day. The machines are of latest type, tooled up and running under power on significant jobs. In another section of this show room are small tools, gages, magnetic chucks and various other products.

No attempt has been made to make this show area resemble a cocktail lounge or a chromium plated barbers' shop. It looks exactly like what it is—a light, clean and beautifully equipped machine shop. Kept in "apple-pie order" at all times and staffed by skilled men who can explain the equipment clearly as well as operate it skillfully, this sensible show room unquestionably is playing an important part in Brown & Sharpe's selling activities.

If it is true that "a picture is worth a thousand words", then it can well be true that a modern machine tool in productive operation "is worth a thousand pictures". That is in fact exactly the impression I gained through my own first-hand study of the Brown & Sharpe line in action.

VERSATILE MACHINES: Whenever I visit Henry K. Spencer and Daniel R. Weedon at Blanchard Machine Co., Cambridge, Mass., I invariably get new slants on the production and precision phases of the machine tool business.

When I called on them a few days before Christmas, we got onto the subject of "versatile machine tools". Messrs. Spencer and Weedon contend that vertical spindle revolving table grinders such as they build are among the world's most versatile machines.

While I was making the rounds of the shop with Henry Spencer, he showed me an unusually big grinder capable of working on automotive body dies. He called my attention to the fact that the same machine which is capable of machining heavy castings and forgings "from the rough"—removing a lot of metal rapidly—also is capable of finishing work both large and small to "tenths" or less and to a few microinches. For example, it is capable of "roughing out" surface plates, then finishing them.

Back in his office, Dan Weedon showed me a collection of tiny watch parts—including pinion staffs and bearing jewels. These are held in wax and end-and-face finished on the same types of Blanchard grinders used for roughing and finishing parts which weigh many pounds. These watch parts, which are handled in big lots in the "wax chucks", are so small that a strong glass must be used to study them.

Fig. 1—Finished hardware from the Ternstedt Division in Detroit goes to warehouse aboard shop trailers, preparatory to dispatching to assembly plants. When the large vanload arrives at the warehouse, a tractor hooks on and pulls out the train of loaded trailers

Fig. 2—Battery-operated pallet truck with controls in handle, is used where space limitations restrict operations of larger trucks. Here incoming palletized shipments are being unloaded at a United Motors service depot in Buffalo

How General Motors Moves

43,750,000 POUNDS OF MATERIAL DAILY

"KEEP 'em moving" is the slogan throughout the automotive industry, applying to everything from incoming shipments of parts and materials to finished cars and trucks moving down final assembly lines. Gone is the old policy of stockpiling materials and feeding them gradually into fabrication as needed. Now they are rushed from the receiving dock directly into processing, a technique which has required concerted attention to every form of materials handling equipment and procedure.

Through the nation-wide network of manufacturing plants operated by General Motors Corp. materials handling ranks high as a key to efficient mass production. Better than 11 per cent of the hourly rated employees in these plants are charged with materials handling responsibilities.

With capacity for building in excess of 12,500 cars and trucks daily, averaging in weight perhaps 3500 pounds each, the GM plants at peak have an indicated load of 43,750,000 pounds of materials and components to "keep moving" every day. The accompanying pictorial sequence illustrate some of the typical materials handling scenes that take place in various GM plants.

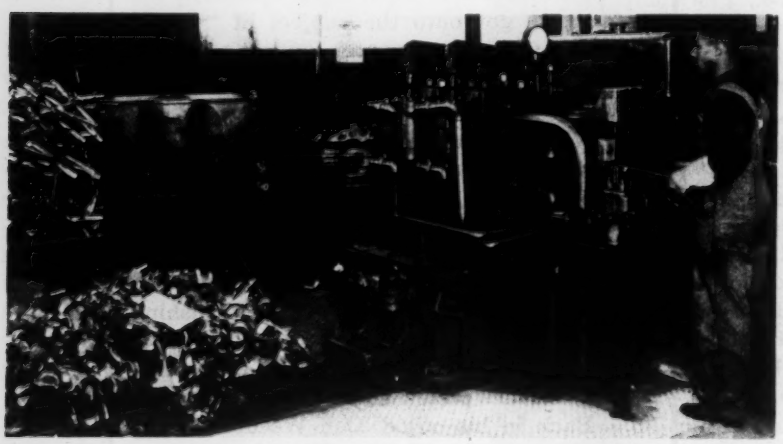


Fig. 5—In all fabricating operations, the problem of scrap handling and disposal must be met. Here, at the Pontiac Motor Division, light gage trimmings and punchings are dumped automatically into a hydraulically operated baler for compressing into "No. 1 bundles", the most sought-after type of automotive production scrap

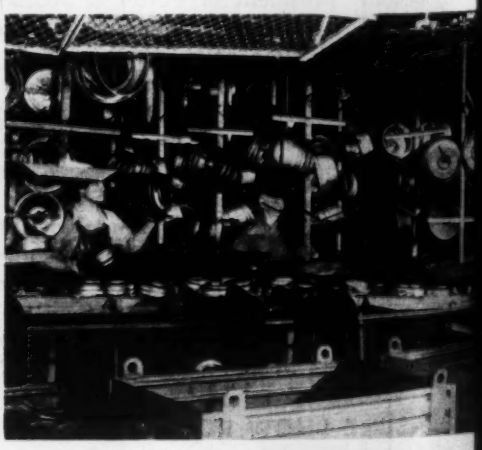


Fig. 6—Belt conveyors, overhead chains and steel tote pans handle the maze of parts in this transfer station at the AC Spark Plug Division, Flint, Mich., where air cleaner parts, after washing, are placed on the overhead chain which takes them to assembly points

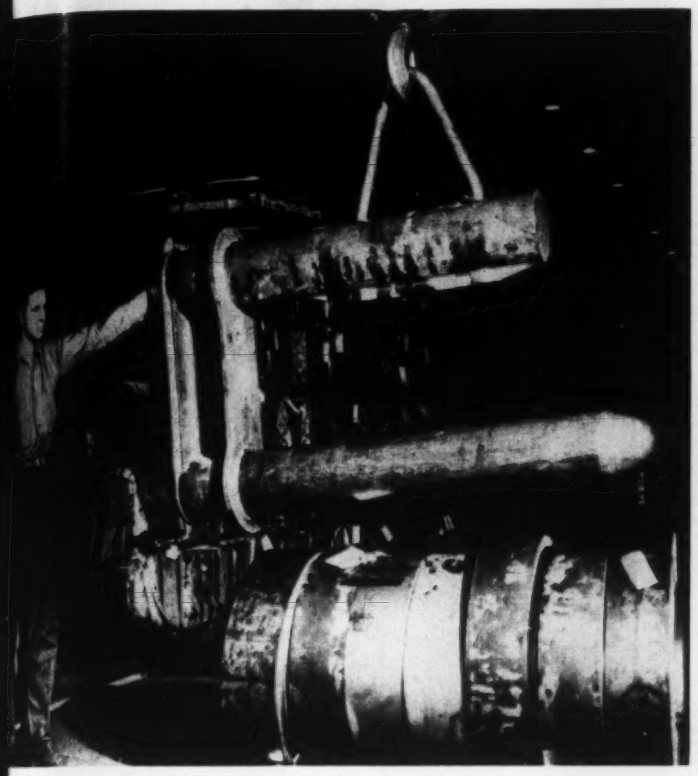


Fig. 3—In use at Delco-Remy is this type of "spindle" hook, a common sight in steel mills rolling coiled sheet and strip

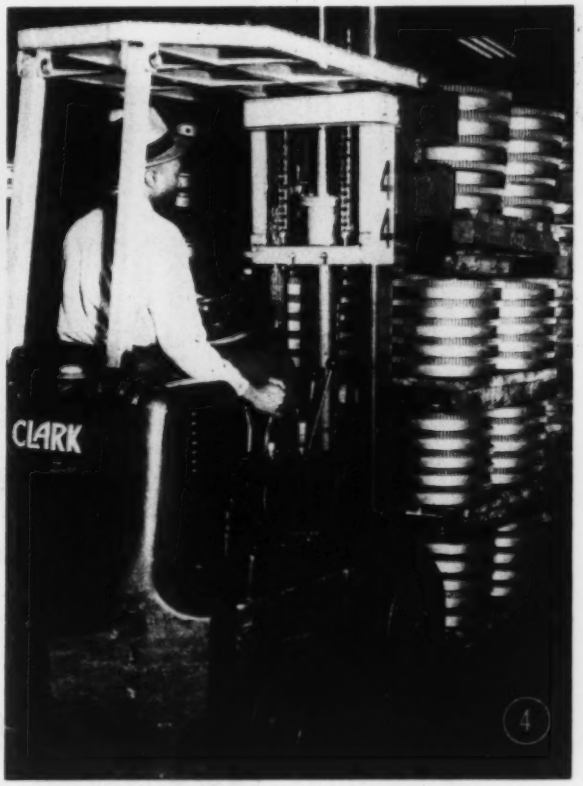
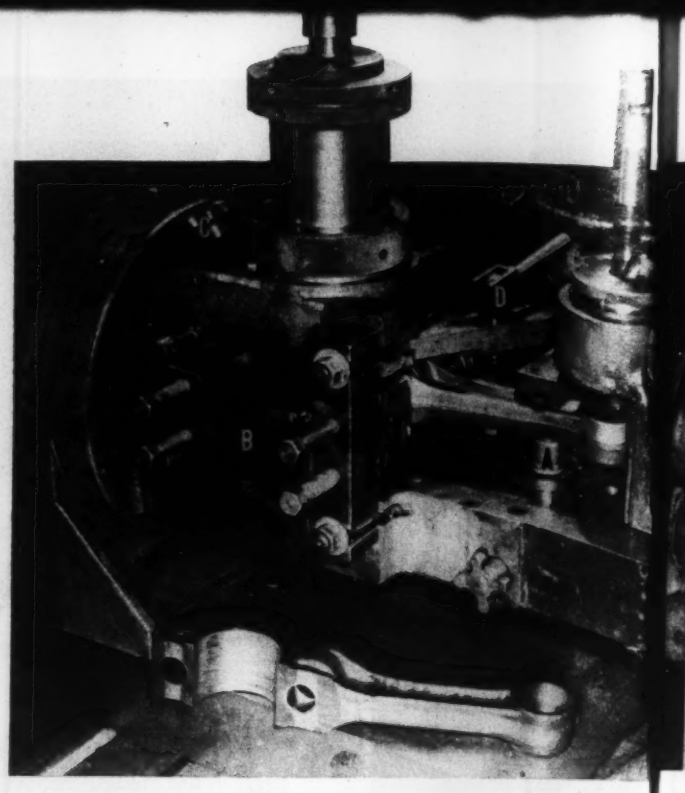


Fig. 4—Palletized flywheels, 20 to the pallet, are stacked temporarily before being moved to assembly stations by this high-lift fork truck at the Detroit Diesel Engine Division. Observe compact design of truck and rugged bracing of the lifting rails

Fig. 7—Conveyor belts by the mile are standard in all auto plants. Here is an inspection belt for plated parts at the Cadillac Division. Overhead is a special diffusing hood to provide uniform lighting of the moving pieces, while in the background may be seen light-weight tubular steel racks in which the parts are carried to final assembly

Efficient Tooling . . .



Serves Variety of Connecting Rod Machining Operations

By ROBERT MAWSON

Automobile engine connecting rods, although differing widely in size, require similar machining operations. One particular fixture is so efficiently designed that it serves eight different assemblies with slight adjustment for each

MACHINING the details for automobile engines may well be considered mass production operation. It is necessary that high grade tool engineering practice be employed, such as locating, holding and quick-acting fastening and releasing devices. To meet any changes in model designs the engineer should design the tools so that with minor changes the equipment can be used efficiently to machine other types of engine parts.

The Hercules Motors Corp., Canton, O., uses these mass production methods when machining the connecting rods for the automobile engines which they build. Some of these special tools are described in this article. The fixture shown in Fig. 1, for work being performed on a radial drill, is used for the following operations: Spot face 2-inch diameter at the side of the wrist pin end for location; spot face one side of crank end for location; rough drill, semifinish and spot face one side of wrist pin hole; and rough drill, rough counterbore and undercut two bolt holes at crank end.

Purposes of these operations are, first, to provide locating surfaces which are used in all subsequent operations and, second, to rough machine surfaces in order to remove stock and relieve stresses.

Fixtures Used—The trunnion type fixture is first rotated 90 degrees from the position shown and the connecting rod is placed on the hardened steel pin A. The clamp B is then swung into the machining position and fastened with hexagon nuts on two studs which pass through slots in the clamp. Four set screws in the clamp are next tightened which move a steel block against the connecting rod. This motion forces the rod into position against a steel locating block.

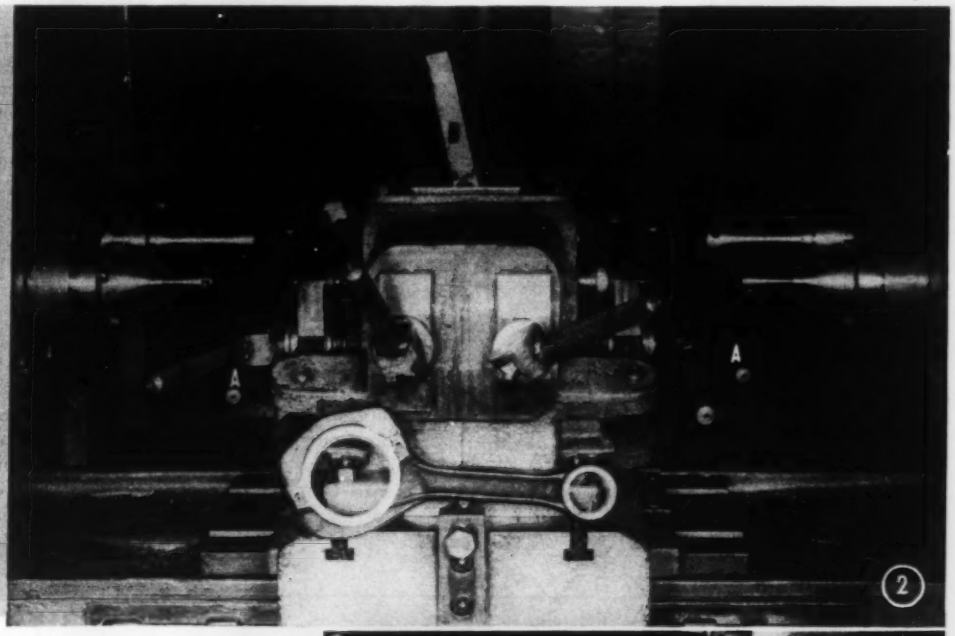
The knob C is then operated, moving a screw against the end of the connecting rod to force the other, or wrist pin end, in contact with an adjustable set screw. The double-hardened steel clamp D is then tightened onto the workpiece with the handle to hold the rod securely in position.

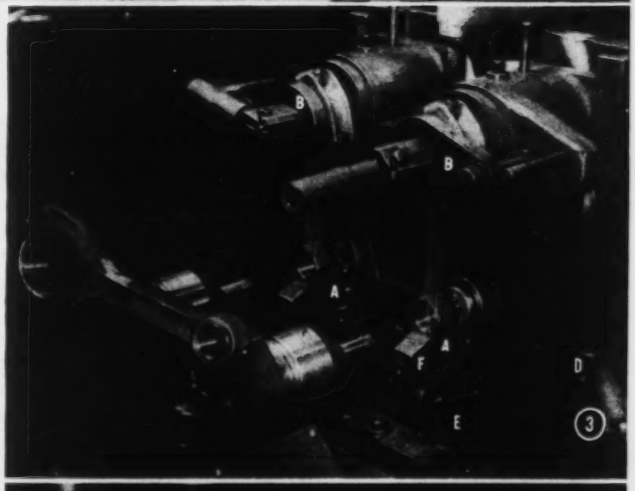
The drill fixture and workpiece is then rotated back 90 degrees to the position shown in the illustration. The locating spots are first machined, then these operations are performed in sequence: Spot facing one side of the crank end; rough drilling; semifinish; and spot facing one side of the wrist pin hole. The fixture is then returned to the original position and the two bolt holes are machined. For all of the operations the tools are guided through hardened and ground steel bushings.

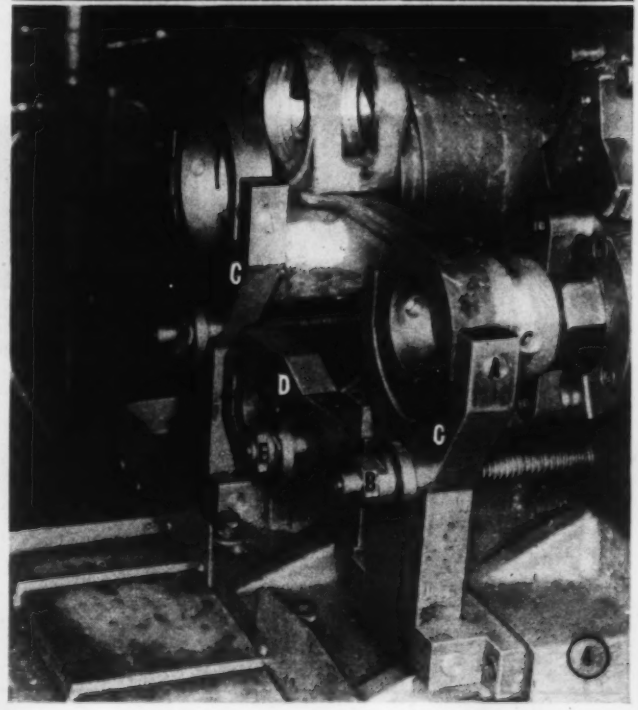
Fixtures Mounted Together—Two fixtures are employed in milling one side of the crank end boss and milling the top of the joint face keys. These fixtures are mounted together on a Sundstrand milling machine. A fixture at the right holds four rods which are located by means of the 2-inch spot faced holes which were machined in the previous operation. A fixture at the left also holds four connecting rods which are located by the side of the crank end; they were

Fig. 1—Trunnion type fixture for use on radial drill. Operations performed provide locating surfaces for subsequent operations and remove stock and relieve stresses by rough machining

Fig. 2—Setup for boring crank and wrist pin holes







also machined in a previous operation. The rods in the right hand fixture rest on the heads of screws for adjustment to suit variations in the forgings.

Connecting rods in the left hand fixture are located by hardened steel blocks. The forgings in both fixtures are moved and held in position with quick-acting clamps. The fixtures are arranged on the machine table so that the operator is unloading and loading one fixture while the cutters are machining the connecting rods in the second fixture. Both of the fixtures are designed to include the detail shown plus four other connecting rods similar in design but varying in size.

Method employed when precision boring the crank and wrist pin holes in the rods is illustrated in Fig. 2. There are two loading stations, the operator loading one while the other is in the machining cycle. The machining operation is performed on a double-end four spindle Excello boring machine. Each forging is located by hardened steel pads at both the crank and wrist pin ends.

Holds Workpiece—Clamps operated with cams and moved with the handles A force and hold the forgings in contact with the locating pads. The lever or handle B provided with a rounded end, contacts the connecting rods and is moved alternately to right or left. It is also used to assist in holding the workpiece during the boring operation.

It is necessary that the distance between the crank shaft hole and wrist pin hole be machined

Fig. 3—Accurate machining of distance between crank shaft hole and wrist pin hole is necessary. This fixture was designed for that purpose

Fig. 4—Crank hole, wrist pin hole and link rod bar are machined in this fixture for another type of connecting rod

accurately. The fixture that is used for this purpose is illustrated in Fig. 3. This operation is performed on an Excello two-spindle single-end boring machine. The two connecting rods are located on steel plugs which fit the machined crank shaft holes. The wrist pin ends of the rods are located by hardened steel V-blocks A, one for each forging. A swinging clamp B is then moved over a stud which passes through the crank hole and the cam clamp C. When rotated, the clamp holds the connecting rod at the crank end.

Cam D, one for each rod, is then brought into action. pushing out a steel pin E and rotating the clamp F to hold this end of the connecting rod securely in contact with the locating block A. The hole in the wrist pin bushing is bored to the desired size, as held in place by this tooling. It is interesting to note that this fixture is tooled to include five different connecting rod assemblies of varying lengths and bore sizes by simple changeovers in the fixture.

To Specified Contour—On one type of connecting rods a channel is to be machined $1\frac{3}{16}$ inches wide and of a specified contour. The fixture is used on a No. 4 Cincinnati vertical milling machine for this operation. The connecting rod is placed on a hardened steel pin which is machined to be a good sliding fit in the wrist pin hole. The crank hole fits over a hardened steel plug. Two bolts are provided with a hook end to fit over the outside of the rod at the crank end. These hook type bolts are rotated into position and tightened with nuts. This action draws back the rod and holds it securely against the locating plug. Two screws are next tightened onto the rod to hold it securely in position.

The tracer template, made of steel, is attached to the fixture and the tracer wheel is fastened to an extension on the milling machine. As the machine revolves the table is fed in and the tracer wheel follows the contour of the template and a similar contour is machined in the connecting rod by the milling cutter.

Another type of connecting rod made at this plant has a crank hole, wrist pin hole and a link rod bore. The fixture employed when machining these holes is illustrated in Fig. 4. The connecting rod is located by a steel pin A to fit the 2-inch hole previously machined in the wrist pin end. The crank end of the rod is positioned on steel blocks. The rods B are then drawn back by cams at the opposite end of the rods. This action rotates the clamps C in contact with the connecting rod to hold it securely in place.

This fixture is used in two positions. In the first position the crank hole and wrist pin hole are precision bored. The cams are then released and the springs on the rods B remove the clamps C from contact with the connecting rod. The connecting rod is then moved to the second position and held in alignment with hardened steel pins or plugs which fit holes in the fixture and the two bored holes in the rod. The clamp D is then tightened through the medium of the rod by means of a cam at the opposite end. In this second position the link rod hole is then precision bored. The fixture is also used in the first position when boring the crank and wrist pin holes after the bearing shells have been assembled.

Rods Are Honed—In order to obtain an accurate crank bore which is correct as to size and smoothness, the connecting rods are honed on a No. 200 Micromatic Hydrohoner. The rod is located on a hardened steel pin which fits the wrist pin hole. The crank shaft end is positioned by a steel pin and steel blocks. The clamp is then tightened against the rod with a handle-operated cam to hold it in position. With the connecting rod in this position, the machine is started and the crank bore honed smoothly to the correct size. The unusual feature of this fixture is that eight different connecting rod assemblies are tooled in the unit. By simple and quick changes any of the eight details, rods differing widely in size can be machined.

It can readily be seen that the fixtures embody the necessary prerequisites for mass production machining operations. The workpieces are located accurately, held securely and, by quick and simple adjustments, can be used to machine similar details with a wide range of sizes.

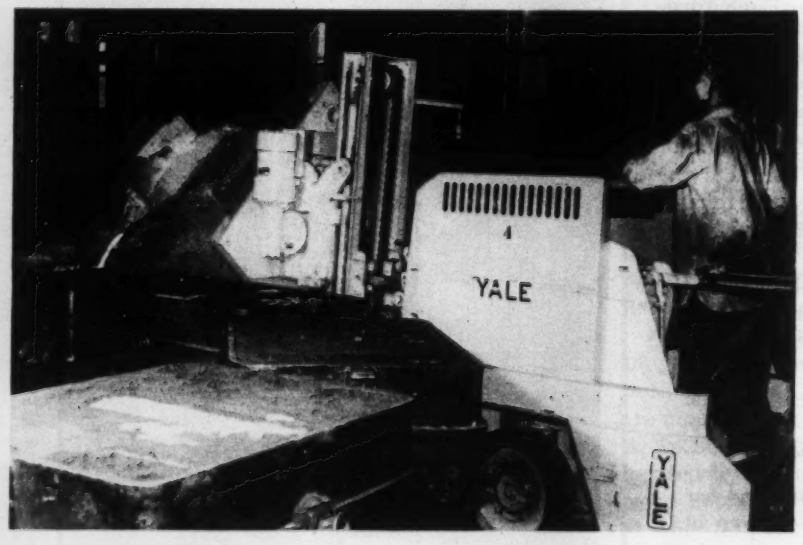
POURING CAPACITY

Increased 50 Per Cent

MOVEMENT from flask to flask, pouring molten metal as required, is the function of a fork truck equipped with a rotating carriage for pouring in a Southern iron works. With the entire operation performed by the truck operator, a 50 per cent increase in pouring capacity and a decrease in work hours of 50 per cent are being realized. Operator rotates the ladle to keep a constant flow of metal to the mold; at the same time he is located a safe distance from the hot ladle.

Fabricated around the base of the ladle are four hollow rectangular steel tubes which permit the forks of the truck, made by Yale & Towne Mfg. Co., Philadelphia, to pick up the ladle from any one of four directions. Tubular construction prevents the ladle from falling off the forks as it is tipped for pouring.

The slowest of two speeds on the 360-degree rotor gives added control when pouring metal. Ladle holds 4150 pounds and is 34½ inches in diameter and 39 inches high. Truck is an end controlled fork model of 54-inch wheel base, 83-inch mast height and 54-inch overall width.



These concave harrow discs are ground and polished in one lightning-fast, dollar-saving operation with RESINALL METALITE Cloth Belts and backstand idlers. Typical of the versatility of this profitable combination is the way these discs are given a spun finish by the action of the abrasive belt, which cuts and at the same time revolves the disc on its ball bearing fixture. Removing the scale and polishing takes only 18 to 35 seconds of actual sanding time!

RESINALL METALITE Cloth Belts finish these and many other pieces faster and with less cost because they're resin-bonded to withstand hot, heavy-duty work. The special bond won't get soft and tacky and the belt definitely resists loading and glazing. RESINALL METALITE Cloth Belts cut sharp and fast all the way.

Behr-Manning abrasive belts are slashing finishing costs everywhere. Whatever the material or shape of your products, it will pay you to check with our field engineer in your area. A new bulletin, just off the press, tells the whole story. Write for it today.

BEHR-MANNING®

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TROY, N. Y.

Use NORTON® abrasives Sharpening Stones

Fig. 1—Outer chamber line starts with a machine spotwelding bosses, moves past rear of second station where water manifold is jig-positioned and tacked to shell and then on to third machine which roll-welds water manifold

MAN-HOUR and MATERIAL SAVINGS

. . . effected by resistance welding jet engine components

REQUIREMENTS for jet engine components are highly exacting and competition among manufacturers for this business is extremely competitive. Production techniques borrowed liberally from the automobile and appliance industries are to a large degree responsible for one aircraft partsmaker's success. In this connection, Solar Aircraft Co. has recognized the great possibilities of resistance welding for improving its products while at the same time effecting marked production economies. A description of some of these applications at the company's San Diego, Calif., plant illustrates how it is attaining man-hour and material savings.

Unlike Metals Joined—One of the most noteworthy and recent accomplishments is joining unlike metals by the use of standard low inertia, dry disk rectifier type resistance welders on its J47 and J34 production lines. Overall production cost savings of better than 70 per cent have been effected with these modern spot and roll welders.

This new development in resistance welding is said to open entire new fields. For example, an afterburner assembly formerly was made entirely of N-155, an alloy of chromium, nickel and cobalt principally, although only a small area of the assembly required the characteristics of this alloy. Now, only the small area requiring the alloy is made of the high-priced metal and is joined to 6 cents-a-pound mild steel which is used for the balance of the assembly.

A number of similar savings are effected by the same resistance welding process. Inconel-X is welded to 18-18 stainless steel. The jet engine assembly, in this case, requires the special alloy for high temperature spring stock. Material savings represent 60 per cent. Another savings of 78 per cent is obtained by joining 18-18 stainless steel to mild steel.

New Welding Equipment—These examples are typical of other savings with late-model resistance welders,

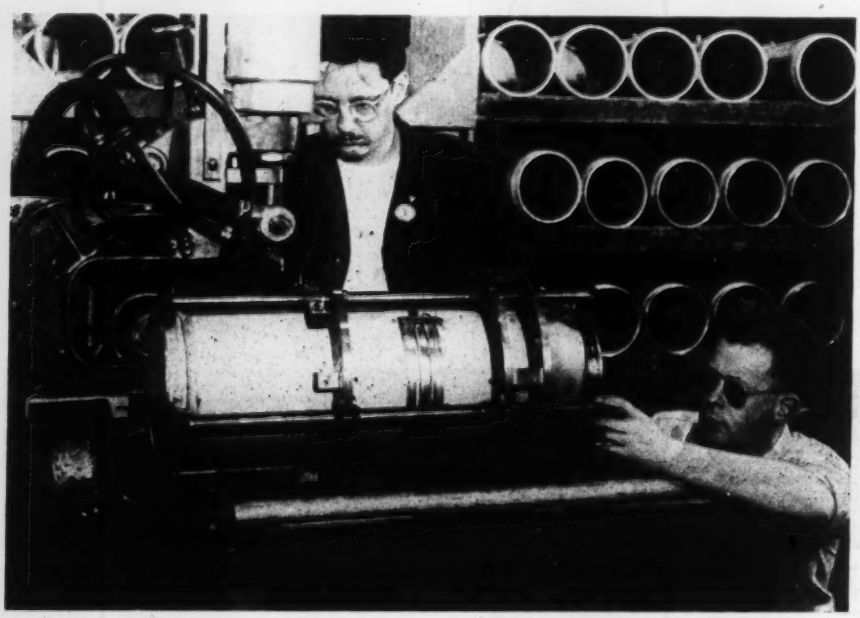

Fig. 2—Jig-positioning assures necessary accuracy in welding outer chamber

four of which are spot welders and one a roll welder. Their low inertia head permits a follow-up force, while the low rate rise of welding current gives sensitive control of a production welding process. Operating characteristics of these resistance welders remove the chances of losing pressure during the welding cycle and thus prevent cracking the weld.

Development of resistance welding machines for a countless number of metal joining processes has given the company's engineers and production men new freedom in the design and fabrication of aircraft engine parts involving vibrational loading combined with high-temperature stress. The San Diego plant production lines employ many resistance welding machines other than those especially used for joining unlike metals.

In following the J47 inner combustion chamber line, for example, the line starts with cap and shell exit being tacked to the liner shell by an automatic multiple-gun welder which fires four guns simultaneously, after which the part indexes six times for a total of 24 welds in 12 seconds. The line moves on to a roll welder which finish-welds the cap and shell exit and continues to a portable spotweld machine that spotwelds the stops, which are small pieces positioned between the cap and cross-over tube holes.

Jig-Positioning—Outer chamber line starts with a machine spotwelding the bosses, moves past the rear of the second station where the water manifold is jig positioned and tacked to the shell and then on to the third machine which roll welds the water manifold. The line turns for the next operation and moves to the front again. First station in the return line is a portable spotwelder which tacks the outer combustion chamber and a roll welder next in line completes the operation.

Precision of movement and of the finished product is possible because the resistance welding machines are making joints in fractions of seconds. A close-up view of some of the methods which make conveyorized mass production methods possible gives some interesting examples of resistance welding. One spot out of line of welds tack welding the J47 outer combustion chamber is cause for rejection because the material in this part is loaded almost to its ultimate strength and a weld out of the general pattern causes stress concentration beyond the ultimate material strength, resulting in premature failure. Jig positioning assures the necessary accuracy.

No **Interruption**—Another example of successful precision welding is found on the longitudinal resistance seam weld which produces a continuous weld over the entire length of the aft frame cone for the J47. This part also is stressed so highly that any deviation from the straight line pattern is not acceptable. To meet this requirement, Solar procured a special roller seam welder which enables the long cone to be welded without interruption. It is a deep-throat, three-phase machine made to the company's specifications.

Welding speed of this special machine is approximately 22 inches per minute. Welded parts contain a minimum of lap, so the operator must pay close attention to prevent expulsion of metal which would occur if the seam deviated from the straight-line pattern. The same machine performs circumferential welds at both ends of the aft frame cone assembly simply by changing the lower horn and rotating the head.

New Metal Powder Standard

NEW standard for the metal powder industry is reported by Metal Powder Association, New York. It describes procedures for the chemical analysis of gray iron to determine total iron content, metallic iron content and ferric and ferrous oxide content. It is designated as M.P.A. standard 7-49T, tentative methods for determination of iron content of iron powder.

The standard remains tentative for a period of 3 years, during which time suggestions for its improvement are desired. It was prepared by the standards committee of the association because methods for chemical analysis of iron, established by American Society for Testing Materials, omitted any direct methods for the determination of total iron, metallic iron or iron oxide content.

Dust Suppression Report

PREPARED to meet the needs of southern California members of the Gray Iron Founders' Society, who are under compulsion to meet demands of local municipal regulations covering smoke abatement is a 27-page book on cupola dust suppression. Published by the society and available from its office in Cleveland, the report is based upon an 80 per cent return of a questionnaire mailed to smoke abatement and air pollution officials throughout the country.

Photographs, charts and operating data are included on equipment by leading manufacturers in the field, as well as on installations developed by individual foundries. Also included are cost data on such equipment when available.

Background information on the industry is contained in the report which sets forth the basic principles in dust suppression. Both wet and dry dust suppression and electrical precipitation are described.

Aluminum Roofing Developed

A NEW aluminum roofing material, Rey Kool 19-inch selvage built-up roofing, is reported by Reynolds Metals Co., Louisville, Ky. Applied in a single step, it consists of a built-up roof surface consisting of two layers of felt, protected on top by a layer of aluminum. Weighing 40 pounds per square, each course as laid covers an area of 36 inches wide with 17 inches of exposed aluminum.

Creates Shipment Problem

SHIPPING of equipment normally is a routine job at Landis Tool Co., of Waynesboro, Pa. But when it came to shipping a 127-ton roll grinder to Australia, sizes of Australian flat cars had to be figured along with tunnel clearances. Flat cars in that country are higher than those in the United States and in some instances have "drop belly" sections between the wheels. All these factors influenced the dimensions of the shipping cases.

Grinder is capable of swinging round work up to 5 feet in diameter and has a length of 24 feet between work centers. Some of the castings used in the assembly of the machine weigh as much as 35 tons.

Twenty-nine tons of lumber were required to make the skids and siding for the 10 shipping cases which were lined inside with tar paper for weather protection. Tops were surfaced with a coat of tar and then topped with tar paper. Six flat cars in all were required to handle the shipment.

Valve Reduces Water Hammer

WATER hammer resulting from sudden closing of a valve in a high velocity pipe line is said to be eliminated by the special dash pot design available in a line of direct operated solenoid valves offered by Johnson Corp., Three Rivers, Mich. Designed for normally closed operation, the No. 4000 series valves slow down closing action to 1½ to 2 seconds.

Dash pot construction consists of a bronze piston fitted within top housing of valve and pinned to valve to follow its movement. An upward seating ball check controls flow through a port in the piston.

SUN "JOB PROVED" PRODUCTS CUT COSTS,

Sun products have been "Job Proved" in the lubrication of almost every type of mining, manufacturing, power, and transportation equipment . . . in refrigeration and air-conditioning . . . in metal cutting, tempering, and quenching . . . in the processing of textile fibers, leather, natural and synthetic rubbers . . . in the impregnation of electrical, electronic, and packaging materials of many kinds.

To help you solve your production problems, Sun Oil Company offers a wide selection of "Job Proved" petroleum products, plus the experience of Sun Engineers. Their know-how and detailed product information are yours for the asking. Call your local Sun office, or write Dept. S-1.

SUN OIL COMPANY • PHILADELPHIA 3, PA.

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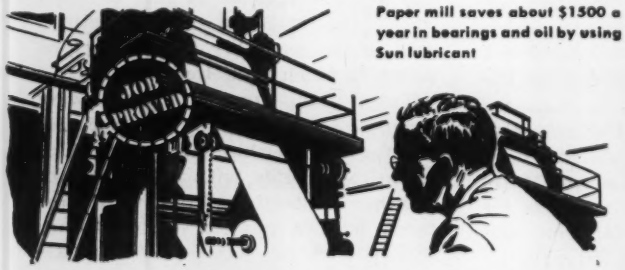
INDUSTRIAL OILS

SUNVIS 900 OILS—High-viscosity-index, paraffinic-type oils—of uniform O F pour point—fortified against rust, corrosion, oxidation, and sludge. The finest available lubricant for turbines, hydraulic systems, and similar applications.

SUNVIS HD 700 OILS—High-viscosity-index oils containing additives which minimize oxidation and give detergency. Ideal lubricants for internal combustion engines subjected to continuous heavy loads under the most adverse conditions.

SUNVIS OILS—Solvent-refined paraffinic-type oils of uniform high viscosity index, low pour point, and low carbon content. Especially suitable for application to long-time use in all types of industrial reservoirs and circulating systems.

DYNAVIS OILS—Low-pour-point, high-viscosity-index, inhibited oils, containing an additive which helps prevent formation of harmful corrosive and sludge-forming acids. Well suited for engines fitted with alloy bearings and operated at high temperatures.



Paper mill saves about $1500 a year in bearings and oil by using Sun lubricant

SOLNUS OILS—Well-refined straight mineral oils. Stand up under hard use for long periods of time. Recommended for use in machine tools, air compressors, certain types of diesels, etc.

CIRCO OILS—Used for general lubrication of industrial machinery when straight mineral oils are required.

SUNTAC OILS—100%-petroleum products which have been compounded to increase their adhesiveness. Recommended for general lubrication of all machines subjected to sudden shocks and load reversals. Cling to the parts to be lubricated.

STEAM CYLINDER OILS—High flash and fire point lubricants for either saturated or superheated steam conditions and for worm-gear speed-reduction units.

SUN CAR JOURNAL OILS—Dark oils meeting A.A.R. Specifications. For use in waste-packed bearings of railroad equipment.

SUN DELAWARE OILS—Dark oils for general lubrication on older types of industrial machinery.

SUNOCO WAY LUBRICANT—For use on tableways. Eliminates chatter and scoring . . . resists corrosion. Has good metal-wetting and adhesive properties, ample viscosity, and E. P. qualities.

SUN MARINE ENGINE OILS—Compounded with special emulsifying agents in order to provide adhesion to, and lubrication of, working parts in the presence of water. For the lubrication of bearings, eccentrics, crossheads, and various other parts of steam engines.

ROCK DRILL OIL—High-film-strength adhesive oil. For use in jackhammers, stopers, drifters, and similar equipment.

INDUSTRIAL GREASES

SUN CUP GREASES—Water resistant. For grease-cup and grease-gun application when service is normal.

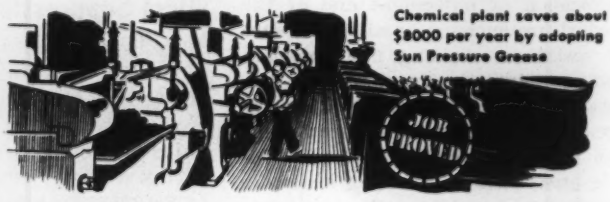
SUN GUN GREASES—Smooth greases made with medium-viscosity oil. Stable under pressure in power and booster guns.

ADHESIVE PRESSURE GREASES—Won't drip or splash. Excellent lubricants for open-gear applications.

SUN DARK PRESSURE-SYSTEM GREASES—For power-driven central grease lubricating systems in heavy industries. Also used as a "medium cup grease."

SUN MINE CAR GREASES—Available in several grades. Suitable for both antifriction bearings and plain-bearing cavity-type wheels.

SUN MINING MACHINE LUBRICANT—Semifluid. For use where a light but adhesive grease is required. Resists separation and decomposition.



Chemical plant saves about $8000 per year by adopting Sun Pressure Grease

SUN ROLLER BEARING GREASES—For use on electric motors and generators and high-temperature machinery equipped with ball or roller bearings.

SUN GEAR COMPOUNDS—Black adhesive open-gear compounds and

"JOB PROVED" IN EVERY INDUSTRY

SUN PETROLEUM

SPEED PRODUCTION, IMPROVE QUALITY

wire-cable greases. Recommended for power presses, mining machinery, worn reduction mills, crushers, pump gears, etc.

SUNOCO TRACTOR ROLLER COMPOUND—For crawler-type tractors. Provides good lubrication with exceptional sealing qualities.

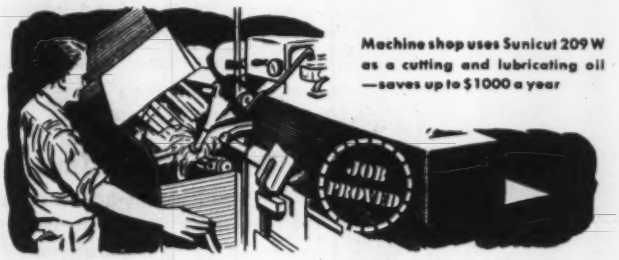
METALWORKING OILS

SUNICUT—Straight (non-emulsifiable) transparent cutting oils. Recommended for automatic screw machines and heavy-duty machining operations. Permit high speed production with excellent finishes, long tool life.

SUNOCO EMULSIFYING CUTTING OIL—A self-emulsifying oil which produces a stable white emulsion. Efficient and economical cooling and lubricating medium for turning, milling, drilling, and other metalworking operations on both ferrous and nonferrous metals. It is also an excellent grinding coolant.

SUN QUENCHING OILS—Specially refined oils designed to aid development of maximum physical properties in a wide variety of steels.

SUN TEMPERING OILS—Specially refined oils for tempering steel. Because of their low carbon content and stability under heat, these oils have an unusually long service life.



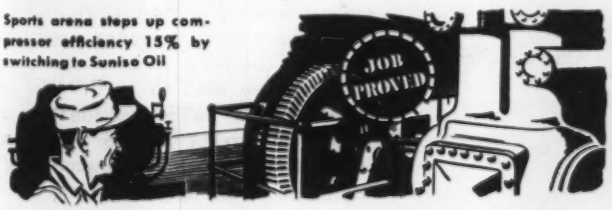
Machine shop uses Sunicut 209 W as a cutting and lubricating oil —saves up to $1000 a year

SUN ROLLING OILS—Straight and emulsifying oils which will permit maximum production in rolling steel, aluminum, brass, and copper.

SUN ANTI-RUST COMPOUNDS—Petroleum-base oils with chemical additives designed to prevent the rusting and corrosion of steel.

REFRIGERATION OILS

SUNISO REFRIGERATION OILS—Have extremely low pour points, extremely low wax-separating characteristics, a high degree of stability and long life. Initially neutral and resistant to formation of detrimental acids under service conditions. Suniso Oils are high quality oils suitable for both high- and low-temperature operations. The most widely used oils in refrigeration and air-conditioning.



Sports arena steps up compressor efficiency 15% by switching to Suniso Oil

TEXTILE-PROCESSING OILS

SUNOTEX TEXTILE OILS—Designed to impart certain additional properties to various forms of fibers during their processing from the fiber state into a manufactured product. All Sunotex textile oils are emulsifiable in water. Highest rating in fadometer tests.

SUN COTTON CONDITIONING OILS—Pale mineral oils which condition the cotton. They prevent waste by cutting down excessive amounts of "fly" (fine air-borne lint particles).

Worsted mill obtains easier scouring, better quality, larger yield with Sunotex WO-220

SUN ASBESTOS FIBER CONDITIONING OIL—Used for spraying on the asbestos during processing. Fibers are kept from being damaged or broken down, and harmful dust is minimized when this product is used.

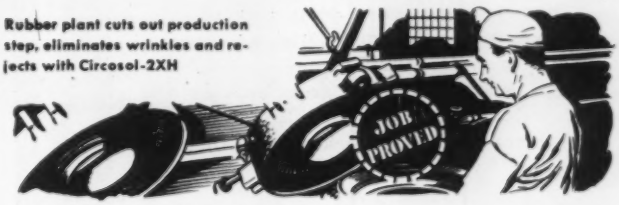
SUN CORDAGE OILS—Generally used alone, but are adaptable to various formulas used by cordage manufacturers. Selected products, highly compatible with additives.

RUBBER-PROCESSING AIDS

CIRCOSOL-2XH—An elasticator and processing aid for natural rubber and especially for GR-S. Outstanding for sponge rubber.

CIRCO LIGHT PROCESS AID—A processing agent and excellent softener for natural rubber, natural rubber reclaims, and neoprene synthetic rubber. Used for GR-S to some extent.

SUNDEX-53—An inexpensive product suitable for processing GR-S and blends of GR-S and natural rubber. An established processing aid for rubber footwear stocks and semihard rubbers.



Rubber plant cuts out production step, eliminates wrinkles and rejects with Circosol-2XH

CIRCOMAR-5AA—A black-colored product for processing natural and GR-S rubber used in tire-making. Also used in reclaiming natural-rubber scrap. Replaces asphalt fluxes. Free-flowing at room temperature.

WAXES

Sun's new wax plant was completed in 1949. Its many refining innovations and extreme flexibility permit new types of waxes to be manufactured in large quantities—a procedure heretofore impracticable. A wide range of fully refined paraffin and microcrystalline waxes will be "tailor-made" to meet the requirements of virtually all major industrial applications. Pilot plant samples of several grades are now available.

MISCELLANEOUS INDUSTRIAL PRODUCTS

SUN SOLVENTS—Sun Spirits for the thinning of paints, varnishes, and enamels, and for metal-cleaning . . . a pure, water-white petroleum solvent free of corrosive sulphur. Other Sun solvents with special properties are available for the chemical industry.

SUN LEATHER OILS—Mineral-base leather oils. Used for obtaining the desired tensile strength, proper temper, and controlled moisture content. Maintain a light even color . . . mix well . . . distribute evenly.

"JOB PROVED" IN EVERY INDUSTRY

PRODUCTS

SUNOCO

LETTERS *to the Editors...*

Welding That Is Cold

On page 117 of your Nov. 21st issue appears an article about *heatless welding*. Either your reporter has tremendous imagination or I'm a bit dense. Will you please tell me, and the rest of the world, where to find the details of the process or perhaps a picture of the device you can carry in your pocket? Could it be a rabbit's foot?

Louis A. Hamilton
Plant Manager
Mesker Brothers Iron Co.
St. Louis, Mo.

The writer will very much appreciate your giving him the address of the Koldweld Corp. which is promoting the heatless welding process described on page 117 of the Nov. 21st issue of STEEL.

C. W. Holtman
Chief Engineer
Metallurgical Department
American Radiator & Standard Sanitary Corp.
Louisville, Ky.

Would you please send me the address of the Koldweld Corp. in New York in order that I may contact these people. We do a great amount of welding and are therefore very much interested in checking into this process.

Robert S. Miller
Climax Machinery Co.
Indianapolis, Ind.

We have no further technical information than was published, but we understand that no rabbit's foot or magic potion is involved. Koldweld Corp. is at 10 E. 40th St., New York, N. Y.—The Editors

Steel Price Report

In your Sept. 26th issue of STEEL you had a very representative report on steel prices. I wonder if you could forward me a couple sets of clip sheets of STEEL's price section.

Fred C. Young
Manager of Sales
Union Drawn Steel Division
Republic Steel Corp.
Massillon, O.

Requested price section being sent.—The Editors

STEEL Helps the UN

We have great pleasure in sending a copy of the study, "European Steel Trends in the Setting of the World Market," carried out by the secretariat of the Steel Division of the United Nations Economic Commission for Europe at Geneva.

We have noted with much appreciation the interest taken by STEEL in the European iron and steel industry and we would like to mention that yours is the only trade magazine in the United States to which we sent a preliminary copy of our study. We have drawn upon much information published in past issues of your magazine, and wherever we have done so we have not failed to make reference to it. We take this opportunity to express our gratitude for the assistance this material has been to us in our study.

We believe that the subject matter of our study is one of vital importance, both to Europe and the United States, at a time when European development plans are still taking shape and in the implementation of which the United States is playing such an active part.

T. Rollman, Director
Steel Division
European Office, United Nations
Geneva, Switzerland

Who Makes It?

On page 103 of Dec. 19th issue of STEEL is a picture of a spring used on presses, called Elasticone. We would appreciate advising who is the manufacturer of this item.

H. W. MacIntosn
L. O. Koven & Brother Inc.
Jersey City, N. J.

Manufacturer of the safety device is Central Safety Equipment Co., Philadelphia 25, Pa.—The Editors

Free Parking Information

In the Dec. 5th issue of STEEL, page 73, you published an article entitled, "Parking Problems." Would it be possible to obtain the name of the author and the source of the information on which this article was based?

William Malcolm
Chief Draftsman
Waltham Watch Co.
Waltham, Mass.

We were very interested to note the article entitled "Parking Problems" on page 73 of the Dec. 5 issue of STEEL. Some of the statements made in this article directly concern our operations. If possible, we would like to get in touch with the author of the article. He evidently has a fairly good knowledge of the parking meter industry and its prospects and we would like to discuss it with him in greater detail.

A. C. Daugherty
Rockwell Mfg. Co.
Pittsburgh, Pa.

The article was written by a member of STEEL's editorial staff from information supplied by several manufacturers of parking meters.—The Editors

Selective Hardening

(*Concluded from Page* 47)

is now manufacturing. The unit includes a cold-rolled steel cylinder about 2½ inches in diameter and 10 inches long, slotted at the base, inside of which is a rolled steel screw about ¾-inch in diameter having the same length as the cylinder. The screw or shaft is located at one end of the cylinder by a disk punched to receive the screw end and snugly fits the inside diameter of the cylinder.

Rigid assembly of the cylinder, screw and disk is accomplished by fitting the three pieces together on a fixture, than placing short lengths of silver solder wire dipped in flux around the joints between the three elements, and finally flowing the solder under a coil of an induction heating machine at a temperature of approximately 1250° F.

Closeup of an operator positioning solder on the cylinder end is seen in Fig. 3B; Fig. 3A shows actual soldering operation, two pieces being handled simultaneously by means of a dual coil arrangement.

Clamp Release Saves Time

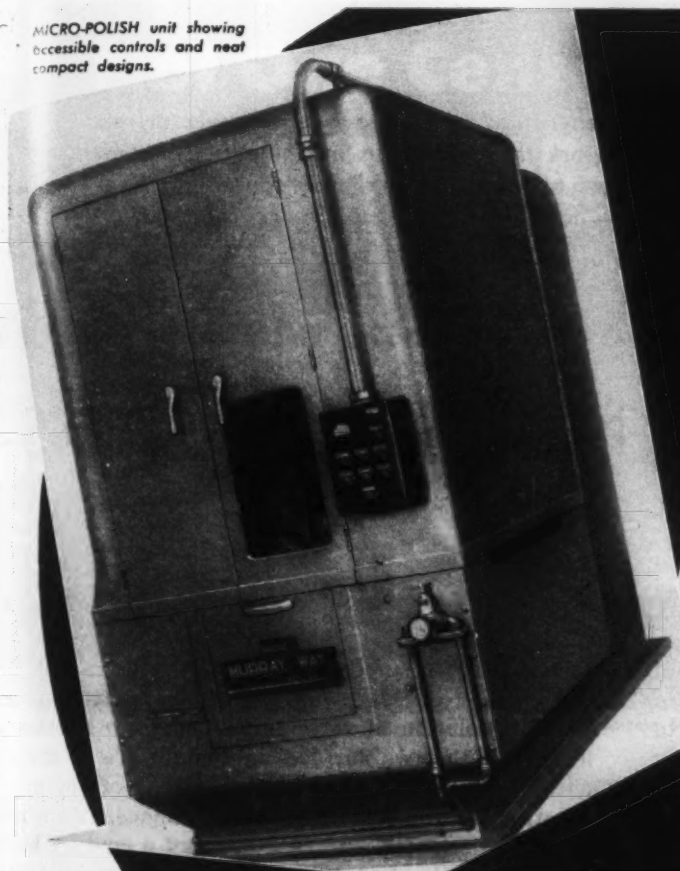
TIME and effort expended in running up the clamping screw is considerably reduced by a semiautomatic action clutch feature applied to "C" clamps and machinists' vises. A spring-backed finger button acts as a release for the clutch which is normally engaged with the thread of the screw. According to its distributor, Lockrey-Fater Corp., New York, the clutch cannot be disengaged while pressure is on the work.

First application is to 4, 6 and 8-inch size Gordon automatic C clamps, forged from SAE 1040 steel and stress relieved after forging. The design incorporates extra reinforcement at the back corners where most failures are said to occur. The machinists' vise is conventional in appearance, except for the button and is provided with lugs for mounting to machine tools. Moving jaw is V-grooved in both directions.

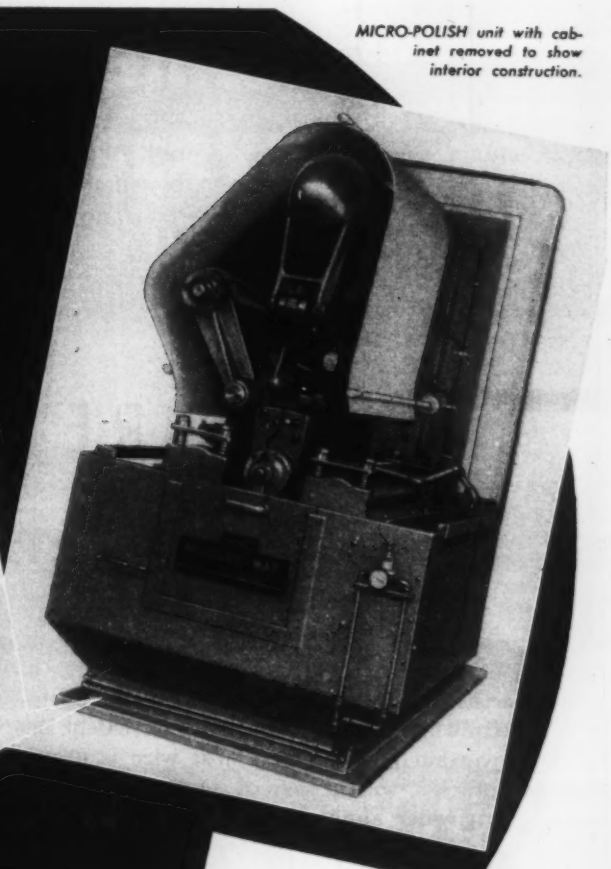
Celebrates Anniversary

ONE hundred and sixty years of continuous operation is being celebrated by Congdon & Carpenter Co., of Providence, R. I., suppliers of stainless and carbon steels, metals, tools and industrial supplies. Photographs of company operations, old and new plants and employees, both past and present, are contained in the *Courier*, published by the company. Founded in 1790, the company maintains plants in Providence, R. I., and Fall River, Mass.

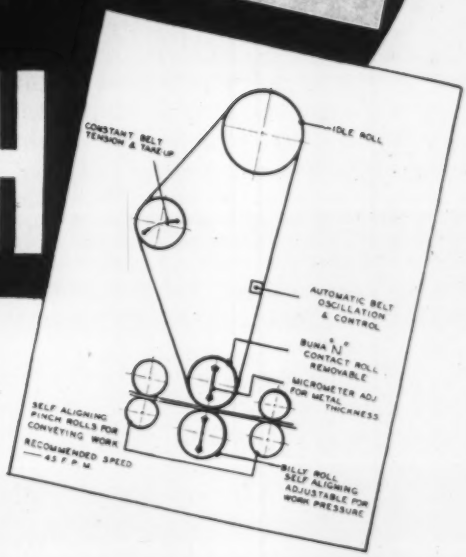
MICRO-POLISH unit showing accessible controls and neat compact designs.



MICRO-POLISH unit with cabinet removed to show interior construction.



MICRO-POLISH


IDLE ROLL
CONSTANT BELT TENSION & TAKE-UP
AUTOMATIC BELT OSCILLATION & CONTROL
BUNA "N" CONTACT ROLL REMOVABLE
MICROMETER ADJ. FOR METAL THICKNESS
SELF ALIGNING PINCH ROLLS FOR CONVEYING WORK
RECOMMENDED SPEED 45 F. P. M.
IDLE ROLL SELF ALIGNING ADJUSTABLE FOR WORK PRESSURE

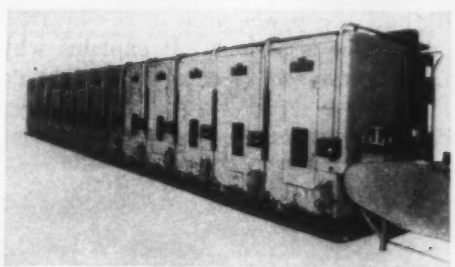
An outstanding system of sheet-grinding and polishing proved-right in actual operation.

You too, will like MICRO-POLISH because...

- Gives higher quality surface for any given grain size.
- Much faster grinding rate without burning.
- Greater operating economy.
- Handles sheet, strip or blanked parts, any width or length.
- It's a wet or dry process.
- Convenient, reliable controls carefully protected from abrasives and foreign matter.

We also manufacture a complete line of buffing and polishing equipment to handle any contour or formed parts. Inquiries are invited.

TERRITORIES OPEN FOR QUALIFIED REPRESENTATIVES.



A typical 12 unit MICRO-POLISH installation.

MURRAY WAY

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3925 WEST FORT STREET • DETROIT 16, MICHIGAN

AUTOMATIC POLISHING, BUFFING, GRINDING EQUIPMENT

FUNDAMENTALS of STEELMAKING

NUMBER 18 OF SERIES

Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.

Wire benches of a generation ago have been largely driven out. For multidraft work the continuous machine beats them by eliminating a series of laborious and time-consuming handling operations whose high cost is now being realized

Production of WIRE AND WIRE RODS

By KENNETH B. LEWIS
Consulting Engineer
Worcester, Mass.

PART II

ALTHOUGH there is room for serious doubt as to whether there is lubrication in any accepted sense in the wiredrawing die, the term is a convenient one to describe certain phenomena. Most wire is drawn by the dry process, with a coat of lime or its substitute, and soap powder applied at the die. The hydroxide sull provides a nonskid surface in which the lime entangles itself; the soap is trapped by the rough lime, pinched in the die cone, and all three converted into a tri-partite film of great rigidity which, properly built up, can stand upwards of eight substantial drafts. It is doubtful whether the film can be reinforced; once established in the first draft, it stretches, wears away, or falls off, till in time it becomes too thin, metal to metal contact ensues, and die, or wire, or both, are damaged. The pressure in the die is of course that of the yield point of the steel, say between 100,000 and 400,000 psi.

Wet drawing means drawing with a fluid lubricant, soapy water, oil, soft grease, or the like. It is inefficient, though sometimes justifiable. Measurements and calculations of coefficient of friction give, for dry drawing, 0.07 to 0.10, and for wet drawing 0.16 to 0.19. Wet drawing is therefore much more wasteful of power in friction, and since friction accounts for about half the power used in the drawing operation, the difference is serious. It explains why wet drawing must always be performed in light drafts. Most wet drawing is preceded by a flash coating of the wire with copper and tin, applied by dipping in an acidified solution of their sulphates, since friction is less when the two surfaces in contact are of diverse natures. This coating technique is one of the many practices stumbled upon by sheer chance. At a mill handling both steel and copper, about a century back, a foreman who had to quench hot ingots of brass, and also to heat up a tub of acid, decided to make one job cancel out the other by quenching in the acid tub, and found eventually that the wire pickled in that tub drew nicely with a pleasing coppery color. The tin addition was stumbled upon some 30 years later when a wiredrawer who had lined an old coppering tub with lead found that the ultra-pleasing straw colored finish on his wire was being obtained at the expense of the soldered joints.

Wet drawing is done on fine wires; originally because it was practically impossible to dry such wires without rusting them, later because a complex network of consumer practices has grown up around the coppered finish. There are some faint signs that wet drawing might fade out in the course of time. Small amounts of coarse wire are drawn wet for appearance, ease of plating, etc. The lime substitutes may some day invade this field.

Wire benches of a generation ago have been largely driven out. For multidraft work the continuous machine beats them by eliminating a series of laborious and time-consuming handling operations whose high

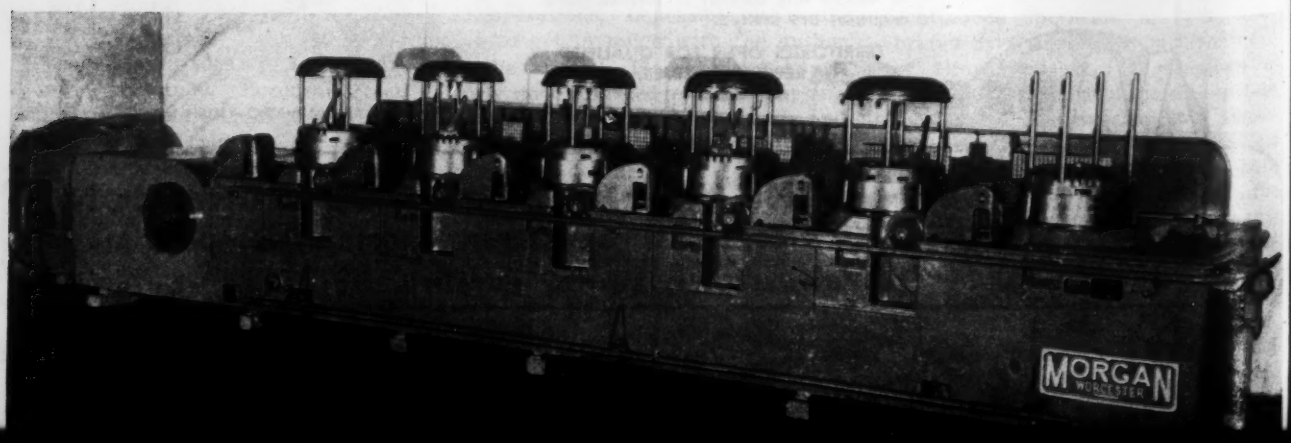


Fig. 8—View of Morgan-Conner continuous wire machine for six drafts

Not One Cent for Maintenance IN 14 YEARS OF SERVICE

Circular Saw Hardening Furnace after 14 years of service—center door partly open.

THAT'S THE RECORD of B&W Insulating Firebrick in Henry Disston and Sons, Inc. circular saw hardening furnace. During 14 years, this furnace handled hundreds of tons of high grade steel. *Despite this grueling punishment, the original walls and roof of B&W Insulating Firebrick are still giving excellent service.*

B&W IFB not only made possible continuously high production, but also assured better quality control . . . due to the quick response of this brick to temperature changes. And because B&W IFB have such a very high insulating value, the fuel savings over the 14 year period were appreciable.

Performance pays off. As a result of this performance, Disston has since lined ten more furnaces of different types with B&W IFB. If you, too, want to increase furnace operating efficiency and lower production costs, discuss your refractory problems with your local B&W representative.

One of the three new Bar Heating Furnaces.

New Bar Heating Furnace under construction with B&W Refractories.

Furnace Specifications

Span of arch 13 ft. consisting of 9 in. K-26 IFB

Length of furnace 15 ft. 6 in.

Height of furnace from hearth to top of arch 2 ft. 6 in.

Side walls and doors 9 in. K-26 IFB

B&W

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 85 LIBERTY ST., NEW YORK 6, N.Y.
WORKS: AUGUSTA, GA.

R-387

B&W REFRACTORIES PRODUCTS — B&W 80 Firebrick • B&W Junior Firebrick • B&W 80 Glass Tank Blocks • B&W Insulating Firebrick B&W Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS — Stationary & Marine Boilers and Component Equipment . . . Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers . . . Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

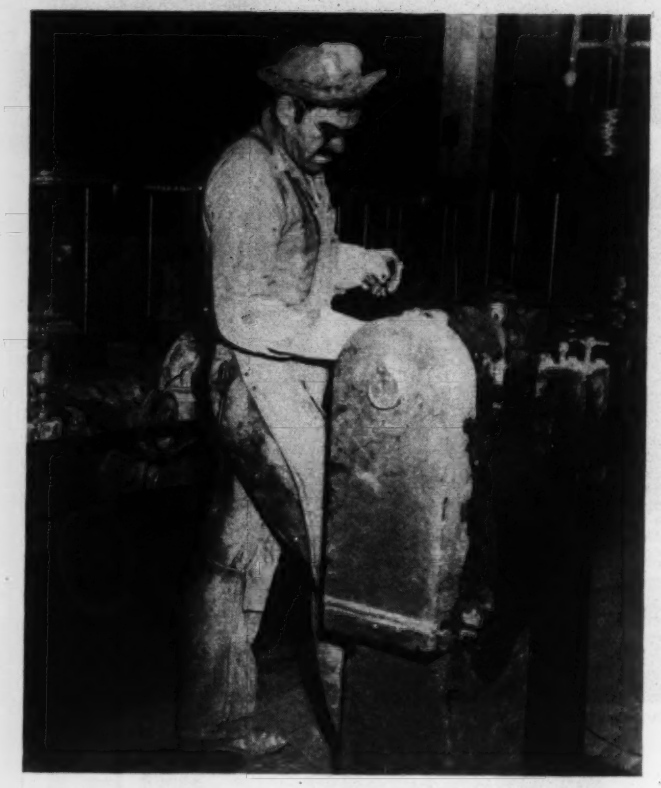
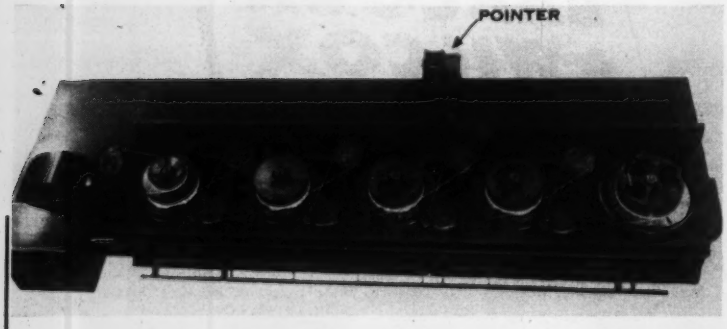


Fig. 9—Threading the Morgan-Conner machine; pointer is shown in foreground

cost is now being realized. Even for work involving but one draft, stiffer specifications require better casting and a more rigid spindle than our fathers used. One curse of the wire industry, probably of other industries as well, is that the minute a new discovery eases the burden of meeting a specification, said specification is promptly stiffened.

Today's standard single block is strong and rigid; its motor is integral, its bearings antifriction, its gears enclosed, self-lubricating, noiseless, and of the quality of a first class machine tool. A creeping start and a generous speed range are generally secured through the use of direct current equipment. Finished wire is stripped from the block mechanically by means of a collapsible stripper and rigid-arm crane, and rods are often brought to the machine on some form of flipper stand involving no labor on the operator's part. There are still a number of installations where, either for sound reasons of practice or through inertia, the draft-by-draft routine is observed. Handling devices have removed hard labor, but there still remains the necessity of having the operator present at odd intervals to push the buttons. This interrupts the smooth current of production and prevents the output per man from approaching the figure attainable through the use of continuous machines. Of these there are three main types, the Morgan, the Vaughn, and the Aetna.

Fig. 10—Looking down on a Vaughn six-draft continuous machine. Wire between capstans loops around swivelling tension arms which actuate rheostats and control speed of individual motors



The Morgan-Connor, first successful dry continuous machine, broke down conservative opposition in the days preceding the carbide die. Previous adventures in continuous dry drawing had ended in frustration because of the impossibility of adjusting speeds to elongation of the wire in the die, and the consequent necessity of using the drums as capstans, with constant backward slip of the wire on all but the last drum. This slip under tension disturbed the plastic film and resulted in destruction of both dies and wire. The Morgan-Connor system suppressed all slip by causing the wire to be withdrawn from each block axially rather than tangentially, such withdrawal being at a rate independent of the drawing speed. Speed relationships are such that a reserve of semi-product accumulates on each block. In time, with the modern practice of welding bundle to bundle and running nonstop, the blocks threaten to overfill, but they are now fitted with individual clutches so that from time to time the accumulation can be run down. A feature of this type of machine is that one motor drives the entire machine, and alternating current can be used.

The Vaughn "motoblox" achieves nonslip operation in another way. Wire approaches and leaves each drum tangentially, but each is independently driven by an adjustable speed, direct current motor whose rheostat is manipulated automatically by the fluctuating length of a loop in the wire as it passes from block to block. "Dancing-rheostat" is the name of this arrangement, which keeps block speeds in perfect synchronism with elongation of wire in the dies.

The Aetna, a comparative newcomer whose debut was rudely interrupted by the recent war, represents an effort to combine the advantages and avoid the weaknesses of the older types. The Morgan machine's accumulations are at once a blessing and a curse. The brief rest facilitates cooling of the wire between drafts, but on the other hand it complicates nonstop operation by requiring the use of clutches and the occasional running down of accumulations. The Vaughn machine compensates for the lack of accumulations by a drastic cooling system, both water and air being employed. In the Aetna machine the accumulation deliberately formed during threading does not thereafter grow. Each block has its direct current motor, and movement of friction ring at top actuates the rheostat. The Aetna units are connected electrically but their mechanical connection to each other is extremely casual, and a continuous machine can be broken down readily into two or more machines, or into a row of bull blocks for single-holing.

Mention should be made of the "slip" type of con-

tinuous machine. As already indicated, its blocks act as capstans, and wire constantly slips backward upon them during the run. In wet drawing this slippage is tolerable, as whatever lubrication exists is constantly renewable, and wet machines are exclusively of this type, which is simple and inexpensive. But wire drawn dry on such a machine loses some of its plastic film by abrasion during the slippage, and tends to seize in the dies. During the days of steel and cast iron dies a few of these dry slip machines, almost exclusively home-built primarily for process wire (redrawn after annealing), maintained a precarious foothold in certain mills where large tonnages of material moved between rigidly fixed annealing points. Users developed unusual skill in their manipulation, and swallowed the high die and maintenance costs for the sake of the undeniable advantages of continuous drawing. The advent of carbide dies bolstered these machines appreciably; they flourish in greater numbers than before, and have invaded in a small way the field from No. 5 rod, but no machine builder has shown any inclination to sponsor the type.

Objective of annealing is generally to wipe out so far as possible the effects of cold work by causing the recrystallization of the amorphous material on the slip planes, thereby restoring to the wire the malleability that will allow it to be drawn further, or to fill some consumer demand. In this respect it differs in no way from other cold worked products, but the fact that its surface area is so great results in the general use of closed vessels and other expedients to avoid excessive loss of metal or carbon.

Our fortunate ancestors, working to specifications which consisted chiefly of the word "wire," simply threw the material into a fire, and later dragged it out. The first refinement seems to have been, if we may trust a suggestion in an ancient manuscript, tossing the bundles into the firebox of a baker's oven after the fires had been drawn. By 1650 the conscientious were enclosing each coil, or small aggregation of coils, in a cylindrical metal pill-box whose cover was luted on with clay, to avoid the "oxydate" which, it was hinted, might injure the dies. The implication is that process wire was commonly redrawn without cleaning. Our generation found the art advanced to a stage where about 2 tons of coils were stacked in a high cast iron pot about 2 inches thick, with single or double covers, and a variable amount of care taken to exclude oxygen. The most elaborate precaution was double covers luted with fire clay and about 5 inches of clean cast iron borings between covers to rob of its oxygen any air which was drawn into the pot during cooling. Chief advance in three hundred years had been in the matter of tonnage treated per unit.

These pots were usually set into deep furnaces with top covers, mostly coal-fired from below. Sometimes the pots were permanently in place and coils loaded and unloaded one by one, the cycle being some forty-eight hours; in other cases the coils were on a spindle which was removed by a crane. In the most modern jobs of that day the pots were removed at full heat and cooled before opening. Temperature was judged

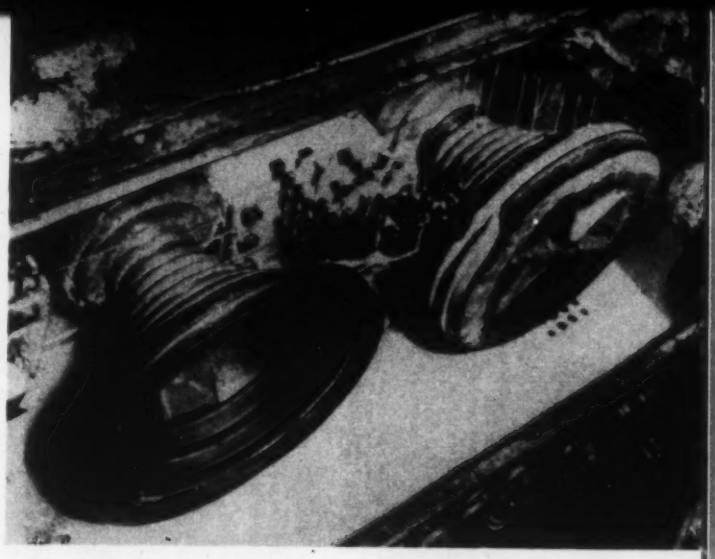


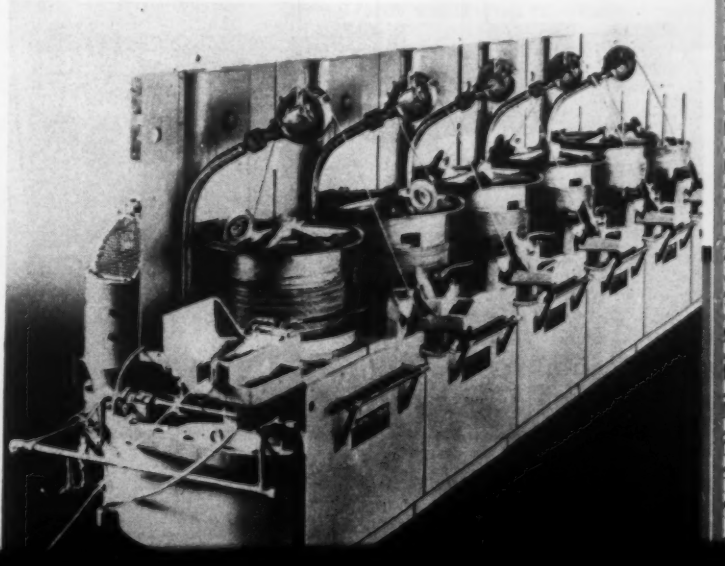
Fig. 11—View inside a Vaughn wet-drawing machine of the cone-type for fine wire

by eye, and a skilled foreman, by cracking the lid at the right moment, usually gaged by spitting on it, could produce a nice uniform blue or thin black scale to order. Some excellent bright work was also done.

The pot usually out-weighed its charge. Steel castings began to replace iron; pot walls became thinner and cycles shorter; pyrometers crept slowly into the picture. Then the terrific waste of fuel entailed in heating these massive containers was drastically cut by a system in which the eye of a stem protruded through a gland in the cover, and the pot, of thin sheet metal, suspended from the cover, carried nothing but its own weight. The crane lifted the stem, which lifted the wire and the cover, which lifted the pot. About this time nonoxidizing gases began to be piped into the pot.

Before this clever thin-walled pot had firmly established itself, there came the pioneers of the bell-type furnace which is now standard. In this system the stem loaded with wire sits on a base and is covered with a sheet metal shield whose skirt dips into an oil seal. A furnace shaped like a silk hat without brim, its inner wall carrying electric resistors, hot tubes, burners, or whatever source of heat is

Fig. 12—Aetna-Standard motor driven units assembled as a six-draft machine. Vertical motors and spur gear transmissions



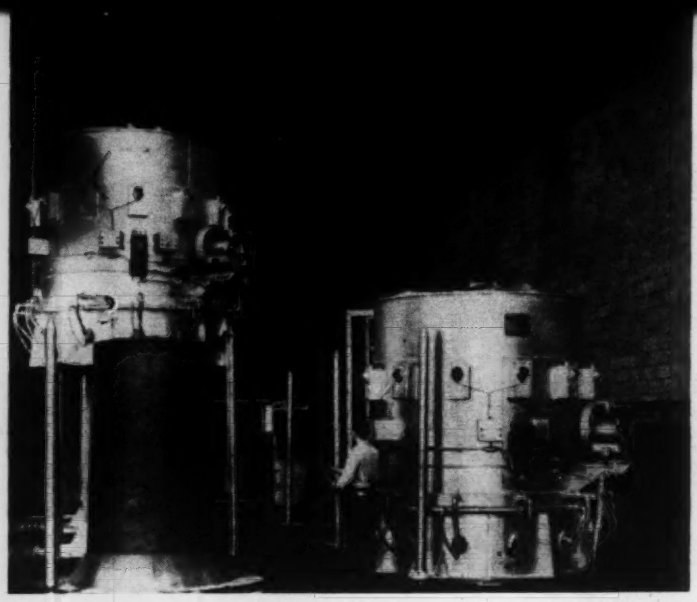


Fig. 13—Bell-type annealer in a bolt wire mill. Lee Wilson Engineering photo

Wire and Wire Rods

favored by local conditions, is lowered over the shield, the wires and tubes connected, and the cycle started. A suitable gas, preferably rather pure nitrogen, is piped into the load to inhibit oxidation and decarburization. This gas is circulated briskly by a fan in the base, which serves to iron out irregularities in temperature between top and bottom as well as outer and inner surfaces of the load. Uniformity reaches a higher state in these bell furnaces than has ever been attained before. It is practicable to anneal a charge of drawn wire with so little disturbance of its surface that it can be redrawn with what remains of the original plastic film.

Regarding temperature, cycles, properties and structure of the product, the variables are too many and complex for treatment in this discussion; a general statement will have to suffice. Most of the wire annealed is under 0.20 per cent carbon. The desired results can usually be secured by heating to about 1200° F and cooling as fast as convenient. A 6-hour cycle would be considered conservative, of which

Fig. 14—Modern annealing installation for fine wire. Lee Wilson Engineering photo

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REPRINTS of previous individual chapters in the series "Fundamentals of Steelmaking" now may be obtained by addressing Readers' Service Department, STEEL, 1213 W. Third St., Cleveland 13, O. Prices range from 20 to 75 cents per reprint. Subjects covered over the past few months include:

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about 2½ hours were consumed in heating. Cooling can be accelerated by flooding the outside of the shell with water, after removal of the furnace, which, by the way, is promptly lowered over a waiting charge. Cooling can be retarded by leaving the furnace in place, or by replacing it with a similar shell without heating elements.

As for structure, the elongated ferrite grains of the drawn wire become equiaxed, though not as in the original rod. Each elongated grain recrystallizes in place into several equiaxed and naturally smaller grains. The pearlite tends to become globular. A faint trace of an elongated structure remains to remind us that the effects of cold work can never be quite eliminated, this being true even in the rare event of a full anneal above the critical point.

Two other forms of annealing merit attention. A bath of fused salt held in a fuel-fired metal pot or in an electrically heated ceramic chamber will receive a charge of wire hanging from a yoke and anneal it in from 10 to 20 minutes. The result is not exactly the same as in orthodox batch annealing, naturally, since time and temperature both play parts in establishment of the annealed structure, and neither can entirely replace the other in influence, but with an adjustment of other factors it will generally serve. It is, by and large, more expensive than other systems and is not generally favored in the low carbon field except in unusual circumstances where its peculiar advantages can be capitalized, but it is much favored in the treatment of stainless and similar ferrous and resistance alloys, especially where temperatures range up to 2000° F.

The other treatment, called patenting, recognizes that where the amount of carbon in steel gives a fair proportion of pearlite in the cross-section, disposition of cementite in that pearlite is important. Cementite, which exists as plates in the pearlite, is extremely rigid, and as plate flexibility varies inversely with the cube of its thickness, the ability of steel to accept deformation will be vastly increased as the pearlite becomes finer. The slow cooling in mass treatment of steel favors the development of pearlite so coarse as

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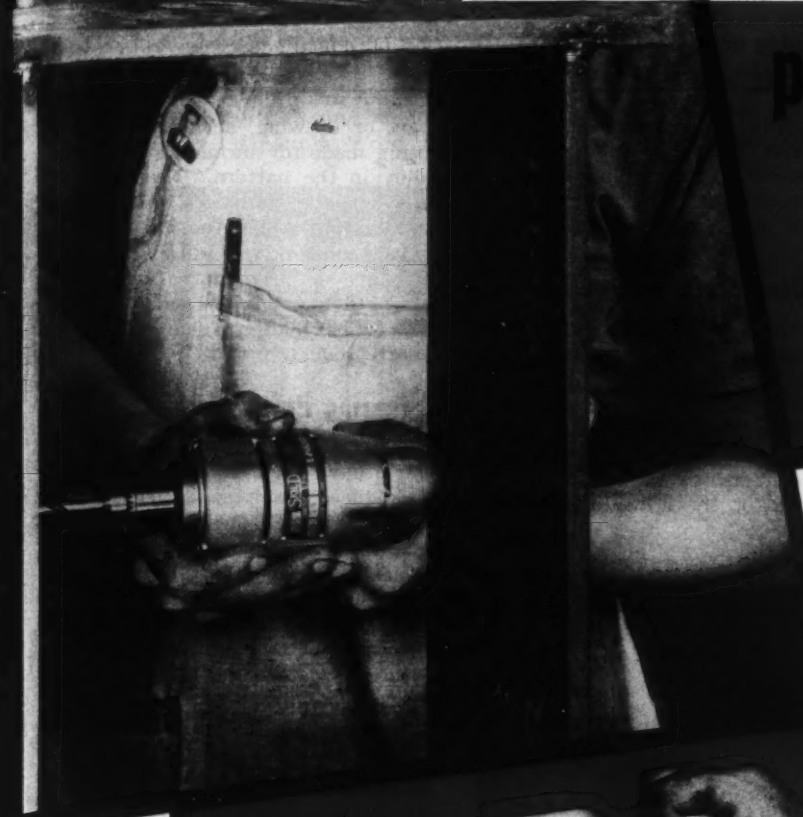

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to barely accept two drafts. In patenting, the wire runs in strands through a continuous furnace and reaches a temperature of about 1750 to 1800° F, and then cools at a fairly rapid rate either in air or a bath of lead or fused salt held at about 950° F. The resultant fine pearlite is extremely ductile and when drafted sufficiently yields a set of properties which are extremely useful in the making of wire rope, springs, piano strings, and the like.

A special patenting system has aroused much favorable comment, wherein the wire is heated very quickly by its own resistance to the passage of an electric current, the lead quenching bath forming one contact and a puddle of low-melting alloy the other. The nature of pearlite is such that it starts to coarsen as soon as temperature falls. In a fuel-fired furnace there is an unavoidable drop in heat at the furnace end and in the gap between the furnace and the quench bath, but in this electric unit the quench comes on a rising temperature producing a finer resultant structure than is otherwise obtainable.

A variant of this process is employed in oil tempering, affording results that are of a similar nature, and whose product makes a superior grade of springs.

(To be continued)

Casting Alloys

(Concluded from Page 50)

usually saturated in electromagnetic fields of 4000 to 20,000 gauss, depending on the coercive force required to permeate a specific material. This requires the use of solenoids or magnetizing coils with 4000 to 6000 amp turns per linear inch and the current provided by step-down transformers or storage batteries.

After saturation, a magnetic casting will slowly lose a certain percentage of its charge for a period of about 12 to 24 hours before it will become "stabilized"—that is, unless it is artificially aged by demagnetization and recharging in the original magnetic field. Demagnetization is usually accomplished by placing the magnet in a low-frequency alternating current field, which requires the use of a coil the same as in magnetization.

Turbine Starts Automatically

PERFORMING automatically and in sequence the starting and stopping operations is a self-starter for a gas turbine in a central service station, built by Switchgear Division, General Electric Co., Schenectady, N. Y. A 3500-kw gas turbine, fired by bunker C oil, will be put through its normal starting and stopping sequence by the equipment at the Farmingdale station of Central Maine Power Co.

These functions will be automatically performed by the unit in properly timed sequence in starting: Energizing the turning gear to "break away" the unit; starting the cranking motor to bring the unit up to partial speed and actuate the air compressor; opening the fuel valve; ignite the fuel; allow the unit to accelerate under its own power; transfer the fuel supply from starting diesel fuel to bunker C fuel for operation. After reaching normal speed the unit is controlled by the operator in the same manner as a steam turbine to synchronize the generator with the bus. In stopping, the fuel supply is transferred back to diesel fuel to purge the fuel lines of bunker C oil, fuel supply is gradually reduced till the flame goes out and unit coasts to a standstill.

New Die Service Offered

DIES that are poured instead of being cut from solid metal and which may be remelted for a future use whenever desired, many be used with the air-operated impact drop stamp made by Chambersburg Engineering Co., Chambersburg, Pa. This is said to be one of the advantages of the

Cecostamp which is capable of forming a wide variety of shapes from all the formable metals.

However, sources of these dies have not been available except where users of the impact drop stamp have put in their own die shops. To make available a ready source of these dies to both prospective and current users of this type of equipment, a zinc alloy die foundry has been established at Chambersburg. Manufacture of the dies, either from the customer's sample part or from drawings, is in accordance with current recognized techniques, the company states. First step is the construction of a plaster pattern made to conform with the part or drawing, accurate allowance being made for shrinkage of the zinc alloy in the pattern. From the finished plaster pattern a sand mold is made from which the die is cast.

Dies made of zinc alloy are claimed to have a reasonably high tensile strength and possess self-lubricating properties, making them suitable for short production runs.

Wearing Parts Eliminated

THOUSANDS of pounds of wearing parts have been eliminated, resulting in reduced maintenance costs on the model 825 DE diesel electric locomotive crane, announced by American Hoist & Derrick Co., St. Paul, Minn. All deck operations of the 25-ton unit are accomplished by diesel power, direct from the engine. Travel is by electric motors mounted on each truck. A direct-connected traction type generator supplies the current.

Broaches Slots Automatically

SIMULTANEOUS broaching of three long and equally spaced slots in transmission synchronizer clutch hubs is being carried out automatically, except for actual loading of parts. The operation, performed on a universal horizontal broaching machine made by Colonial Broach Co. of Detroit, removes a considerable amount of metal, the slots measuring $\frac{3}{4}$ x $\frac{5}{16}$ x $2\frac{33}{32}$ inches.

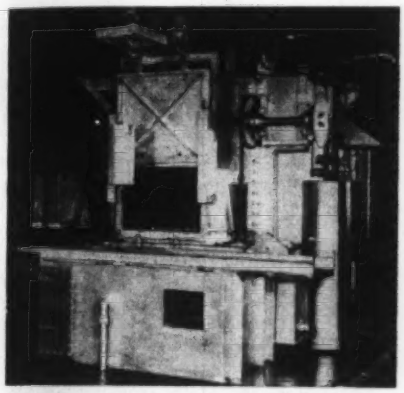
Once the part is placed in the fixture and the start button pressed, the following sequence of operations takes place: Fixture clamps part and shuttles into cutting position; broaches go through the cutting stroke; fixture shuttles back to unloading position and unclamps; and broaches return to cutting position while the operator unloads and loads for the next cycle.

Top broach is provided with a follow-rest; the lower broaches are also supported through their entire travel. The automatic cycle on the 15-ton, 72-inch stroke machine eliminates manual broach handling.

New Products and Equipment

Furnace for Versatility

Designed for clean hardening, gas carburizing, dry cyaniding and other controlled atmosphere heat treatments is a batch-type radiant tube fired unit developed by Surface Combustion Corp., Toledo 1, O. Embodying the high production characteristics of a specialized unit, this furnace is offered with a built-in RX atmosphere generator to provide for various types of treating. Work is



carried in and out of the furnace on four trays which are moved by alloy screws.

A lowerator quench mechanism is included to provide semiautomatic operation for the charging and discharging of the furnace. Fast heating rates develcped by the use of radiant tube firing, combined with a fan to circulate heated and prepared atmosphere, provide production up to 200 pounds per hour gross loads per square foot of area. Maximum gross charge capacity is up to 2500 pounds, depending upon the type of work to be processed.

Check No. 1 on Reply Card for more Details

Lathe with Variable Speeds

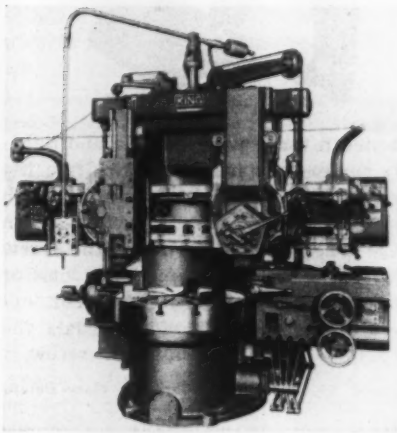
Dial handle at the top of the Mitchell polishing lathe, made by Frederic B. Stevens Inc., Detroit 16, Mich., varies the spindle speed from 1500 to 3000 rpm. Lathe base is of all welded construction and bearing housings are of semisteel castings. Variable speed is obtained by the Roto-Cone pulley, each side of which moves equally on the driving shaft as the speed is changed, assuring perfect belt alignment and uniform wear.

A foot brake is incorporated in the design which instantly cuts off the motor and applies a brake band on the lathe spindle, bringing it to a stop in 2 or 3 seconds. Wheels with up to 6 inch bases may be accommodated. Lathe is driven by a 7½ hp 1800 rpm motor (model 7½-VSD) or a 3 or 5 hp 1800 rpm motor (model No. 3-VSD and 5-VSD). Starters are of the magnetic type with overload and under voltage protection with pushbutton station.

Check No. 2 on Reply Card for more Details

Wide Size Range Boring Mills

General purpose vertical boring mills, made by King Machine Tool Division of American Steel Foundries, Cincinnati 29, O., are offered in a wide range of sizes: Single column, sizes 30, 36 and 42 inches; double column, sizes 52, 62, 72, 84, 100, 120, and 144 inches. All are offered in a



variety of head combinations, with or without side head.

Machines are available either in standard design or with special variations to suit individual requirements. Machine shown is a 42-inch, with left-hand swivel ram head, right-hand swivel turret head and side head. Improvements promote greater accuracy, easier operation and longer service life.

Check No. 3 on Reply Card for more Details

Internal and Surface Broaches

Applicable to either internal or surface broaches and efficient when starting in cast, pierced or forged opening where sand or scale may be encountered is the "whole hog" principle, developed by Acme Broach Corp., Milan, Mich. Broaches are intended primarily for use where stock removal is heavy. Broach portion with this principle contains a short section of teeth having a large number of angular splines ground lengthwise of the broach and having a very fast rise from tooth to tooth.

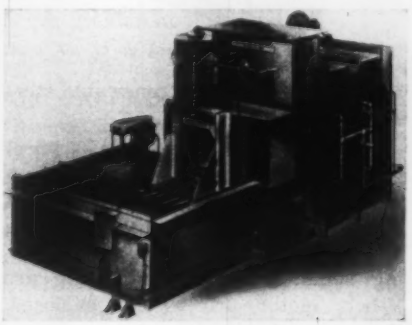
Next section has plain round teeth, each being of the same outside diameter as the corresponding tooth in the spline section; by using this principle, each tooth in these sections is only cutting on approximately 50 per cent of the circumference or surface of the work part at one time. Sections can be kept to a minimum length because of the rapid rise per tooth and tonnage requirements are kept down because very narrow ribbons are cut from the part.

Check No. 4 on Reply Card for more Details

Controlled Atmosphere Furnace

Dry cyaniding, light case carburizing and clean hardening operations may be performed in a new controlled atmosphere furnace offered by Industrial Heating Equipment Co., 3570 Fremont Place, Detroit 7, Mich. Designed for lower operation and maintenance cost, the furnaces have high convection for fast heating, positive passage of atmosphere through the work, simplified construction of alloy components and trays designed for quenching.

Fans and radiant tubes are easily



accessible. Generator is separate from furnace, but close coupled so that gas does not cool and reverse chemically before entering the work chamber. Furnace illustrated quenches through air which permits water quenching or martempering. Units are also supplied with vestibules for quenching from gas atmosphere.

Check No. 5 on Reply Card for more Details

Stitcher Has Heavy Frame

Equipped with a new heavy frame is the model S-13-C metal stitcher, manufactured by Bostitch Inc., 479 Mechanic St., Westerly, R. I. It has a solenoid control, adjustable for single or continuous operation, which is foot-switch operated.

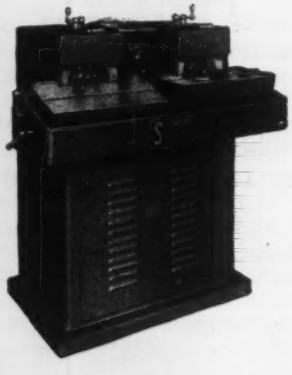
Stitcher may be used for fastening steel, aluminum or other metals, metal to metal, or to other materials. Single $\frac{1}{16}$-inch sheets of cold rolled

steel or multiples up to 0.070-inch in thickness may be stitched. Clincher is 45 inches above the floor. Machine requires a floor space of 16 x 40 inches and is equipped with a ½-hp, 1725 rpm motor and V-belt drive.

Check No. 6 on Reply Card for more Details

For Wet or Dry Grinding

One step takes the operator from roughing to finishing wheel on the twin-wheel wet or dry tool grinder for carbide, stellite and high speed steel tools, made by Standard Electrical Tool Co., 2504 River Road, Cincinnati 4, O. Usable by one or two operators, the grinder has stationary degree graduated independent tilting tables, with table supports integral with the splash pan and



base. Table tops have renewable steel wear plates.

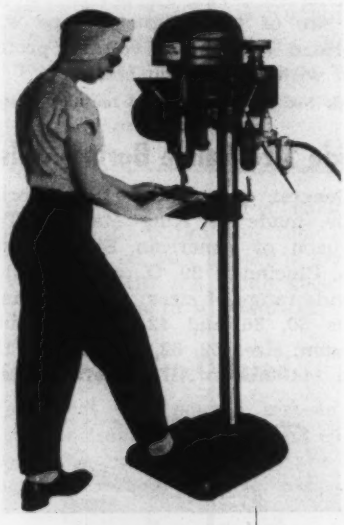
Hinged structural steel wheel guards make it easy to mount new wheels. Each guard incorporates a single 3-way coolant control valve and two spouts for each wheel. Grinding spindles and coolant pump are V-belt motor driven and enclosed. Equipment included consists of reversing control switch, removable covers for access to all parts and equipment, protractor tool guide with diamond holder, tray for tools and honing stone, and built-in exhaust outlets for dry grinding. Models are available with 1½ hp motor for two 10-inch plate mounted cup wheels, or 3 hp motor for two 14-inch wheels.

Check No. 7 on Reply Card for more Details

Screw Driver Is Hopper Fed

Driving speed of more than one screw a second in the smaller sizes, hopper feeding, uniform tightening torque and a minimum of down time for conversion or adjustment are features of the power screw driver introduced by Shakeproof Inc., 2501 N. Keeler Ave., Chicago 39, Ill. All types and styles of screws in sizes ranging from No. 1 x ⅛-inch to ¼ x ¾-inch are accommodated by the specially designed hopper and driving spindle. Installation consists of plugging into a 110 v outlet and connecting to the compressed air supply line.

Operator places screws in the hopper, locates the part to be fastened

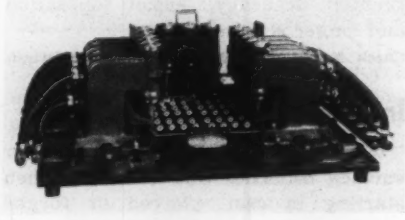


beneath the driving spindle and lightly presses the air pedal to drive the screw. Hopper feed positions each screw properly for traveling down the track to the bit where the screw is firmly held in place until one or two threads are engaged. When operator releases the foot pedal, the spindle returns for another screw.

Check No. 8 on Reply Card for more Details

Multiple Head Riveters

Made to suit the job and utilizing standard heads which may be spaced as close as 2¾-inch centers are special multiple head pneumatic riveting machines offered by Hill Machine Co., 1041 West State St., Rockford, Ill. Air is supplied through a single sole-



noid operated air valve which is controlled by a foot switch in conjunction with an adjustable timer to limit time of riveting cycle.

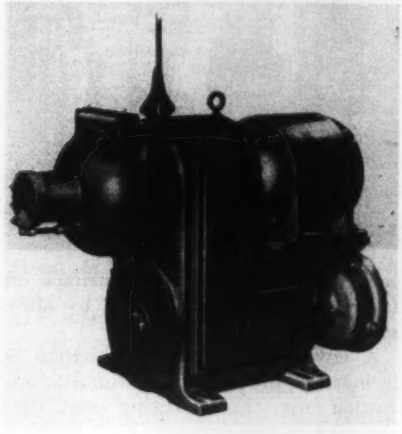
A pressure reducing valve is also provided. By adjusting air pressure and riveting time, the desired peining effect can be closely controlled. Illustrated is a 13-head machine. Each head is provided with a pneumatic clamp to hold the part in the locating fixture. Head position can be adjusted.

Check No. 9 on Reply Card for more Details

Hydraulic Speed Control

A sensitive and accurate means of obtaining automatic speed changing is provided by a hydraulic control developed by Reeves Pulley Co., Columbus, Ind., for use on Vari-Speed Motodrive. With this control installed, it is possible to control tension, velocity, pressure, temperature, liquid level of materials in process and to synchronize operating speeds of machines in the produciton line or parts of the same machine automatically.

Actuating force is secured by connecting control valve lever to any speed indicating mechanism on the



driven machine. Pressure of only a few ounces produces changes in output speeds. Control consists of a self-contained hydraulic power plant and a simple rotary valve, piston and cylinder mounted on the Motodrive in place of the handwheel. The control lever directs the flow of oil into the cylinder, which in turn regulates the position of the piston to change the effective diameter of the driving pulley.

Check No. 10 on Reply Card for more Details

Washed Air Spray Booth

Air turbulence and stratification are eliminated and overspray is minimized, resulting in a reduction of maintenance required, on a spray booth for electrostatic and other automatic low pressure spraying, designed by Despatch Oven Co., 619 8th St., S.E., Minneapolis 14, Minn. The uniform air movement is accomplished by even distribution of make-up air through filters covering the entire rear wall of the booth and by air outlets at four levels across the front curtain. Combination of

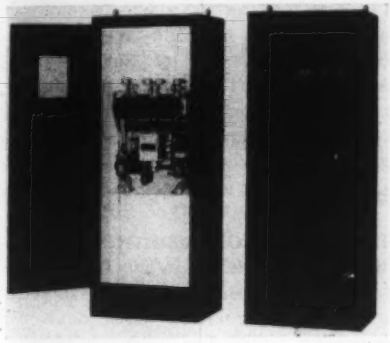
low, uniform air velocity throughout the booth and low pressure spraying through an electrostatic field reduces paint losses.

Filtered make-up air is supplied to the conveyor entrance and exit vestibules to provide seals against factory air and dirt. Paint accumulation is minimized by a split curtain to which up to 50 gallons of water per minute per lineal foot is applied. A guard eliminates splashing. Water flowing over the booth floor collects overspray and carries it to settling tanks for recovery.

Check No. 11 on Reply Card for more Details

Higher Rating Starters

Allen-Bradley Co., Milwaukee, Wis., is extending its standard line of bulletin 709 alternating current, across-the-line solenoid starters with two larger units. Size 6, of 600 amp capacity is offered in 200 hp, 220 v and 400 hp, 440-550 v models. Size 7 of



900 amp capacity, is offered in 300 hp, 220 v and 600 hp, 440-550 v models.

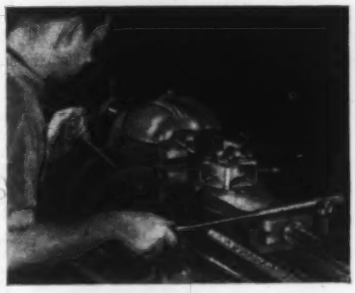
Both units have one-piece magnetic plunger which operates with a vertical straight line motion. Enclosed double break, silver alloy contacts require no cleaning, filing or dressing. Solenoids are energized with direct current drawn from a self-contained selenium rectifier. All terminals and wiring are accessible from the front.

Check No. 12 on Reply Card for more Details

Lathe Turret Accessory

An accessory made for 9, 10 and 13-inch swing lathes made by South Bend Lathe Works, South Bend 22, Ind., is an improved handlever bed turret which, although making possible economical production of precision parts, does not change the basic machine. Turret mounts on the inside bed ways and the base may be locked in position at any point along the usable length of the lathe bed. Head of turret may be positioned close to the spindle nose. Double gibs provide precision adjustment for the turret slide and three needle bearings assure long life and easy action.

Specifications common to all three sizes of bed turret are: Effective feed of turret slide, 4 inches; distance



from center of turret head to top of slide, 1½ inches; head may be bored to take ⅝ or ¾-inch shank standard turret tools; distance across turret head, 4⅞ inches. Turret head will index to within plus or minus 0.0005-inch, measured 4 inches from turret face.

Check No. 13 on Reply Card for more Details

Wire Flattening Mill

Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., is introducing a 6-inch tandem wire flattening mill which operates at speeds of 1000 feet per minute and up. Of improved design, the precision mill has a reciprocating winder, pay-off stand, complete electrical control and dancer rolls to provide constant wire tension. It is also available as a single unit machine or with two stands or more, as required.

Check No. 14 on Reply Card for more Details

Heater Circulates Paint

Better quality paint films with fewer rejects and reduced paint, thinner and labor cost are derived from the use of a circulating type paint heater made by Bede Products Inc., 4311 Ridge Rd., Cleveland 9, O. Spraying directly from the paint container eliminates the separate operation of filling and handling pressure tanks. Additional advantages are ease in making color changes, use of smaller quantities of paint and accurate temperature control of the paint at the spray gun.

Paint pressure and temperature are adjustable and a gage on the supply line to the spray gun shows these values at all times. Paint is heated by two 1000 w cartridge type heaters, with temperature controlled to within ½° of any thermostat setting. Heater comes up to operating temperature within 15 minutes. Fluid pump is gear-driven by a ½-hp explosion-proof motor.

Check No. 15 on Reply Card for more Details

Small Press Improved

A new motor mount with a belt tension stop tends to increase motor and flywheel bearing life by reducing belt tension on the 1 ton plus midget press offered by Benchmaster Mfg. Co., 2952 West Pico Blvd., Los Angeles 6, Calif. Entire motor mount assembly is relocated, with resulting lowered center of gravity of the press.

Frame has been strengthened and clutch mechanism and linkage improved. Easier lubrication is afforded by addition of pressure lubrication fittings at all wear points. Two hold-down slots by which the bolster plate is fastened permits use of standard dies.

Check No. 16 on Reply Card for more Details

• • •

DRYS X-RAY FILMS: Known as Circlair drier, a high-output x-ray film drying machine is offered by General Electric X-Ray Corp., Milwaukee 14, Wis. The intake and exhaust are decreased and provision is made for the air to be recirculated over the heater and films many times to get maximum absorption.

Check No. 17 on Reply Card for more Details

FOR CHECKING CRANKSHAFTS: Nilsson Gage Co. Inc., Poughkeepsie, N. Y., offers a Nilco dial snap gage for checking parts with fillets or where close shoulder checking is necessary. It is equipped with upper and lower radius guides attached to the frame.

Check No. 18 on Reply Card for more Details

FOR HEATING: A new heating unit that can be used interchangeably as a steam boiler or hot water heater by adapting the control equipment accordingly, is introduced by Black, Sivalls & Bryson Inc., Kansas City 6, Mo.

Check No. 19 on Reply Card for more Details

LIGHT WEIGHT HAMMER: Model No. 10 electric hammer, announced by Syntron Co., Homer City, Pa., has a ⅝-inch diameter drilling capacity. It is entirely self-contained, with the rectifying unit incorporated in the handle casting so that operator plugs the hammer cord directly to the 110 v, ac power source.

Check No. 20 on Reply Card for more Details

PROTECTION OF FURNACES: Known as series 21, a new safety shutoff valve is offered by North

American Mfg. Co., Cleveland 5, O. Designed for the protection of industrial furnaces against dangerous accumulations of gaseous or liquid fuels in event of a power failure, valve stops flow of any gas or liquid instantly when the current to its solenoid is interrupted. Valve remains closed until trouble is corrected. It is available in sizes from ¾-inch through 6 inches.

Check No. 21 on Reply Card for more Details

CHECKS ASSEMBLIES: A hydraulic test fixture for mounting on bench for checking hose assemblies, piping, tubing, gages, valves, cylinders, etc., is announced by J. N. Fauver Co. Inc., Detroit 1, Mich. Equipment consists of a low pressure pump for quick filling of equipment being tested from a reservoir that holds approximately 3 gallons.

Check No. 22 on Reply Card for more Details

INCREASED OPERATOR SAFETY: Square D Co., Milwaukee 12, Wis., offers a new circuit breaker type combination starter which features increased operator safety and simplified installation and maintenance. Designed for control of polyphase motors of 1 to 100 hp, it has an interlock that prevents opening the door when breaker is on.

Check No. 23 on Reply Card for more Details

PROTECTION AGAINST DUST: Designated as R5000 respirators, the American Optical Co., Southbridge, Mass., introduces a new line of twin cartridge respirators with a basic face piece and seven interchangeable filters.

Check No. 24 on Reply Card for more Details

DUAL PURPOSE METER: The new beta gamma survey meter, made by Tracerlab Inc., Boston 10, Mass., is portable, battery operated and will serve the dual purpose of a radiation dosage rate meter and a monitoring instrument. It uses a sensitive thin-wall Geiger tube as the detecting device, mounted in a waterproof detachable probe. It is sensitive to gamma radiation and to medium and high energy beta radiation.

Check No. 25 on Reply Card for more Details

STEPLESS HEAT CONTROL: A new laboratory hot plate that provides stepless heat control is available in 12 x 12-inch and 12 x 24-inch sizes. After attaining a surface temperature of 500° F, the Temco hot plate consumes current only 50 per cent of the time. Temperatures can be maintained within close limits over the range of 140 to 850° F. Heater is furnished either for 115 v or 230 v operation and is available from Fisher Scientific Co., Pittsburgh 19, Pa.

Check No. 26 on Reply Card for more Details

RESISTANT TO CORROSION: Air Reduction Sales Co., New York 17, N. Y., announces that No. 718 aluminum brazing wire replaces No. 716. Joints made with No. 718 are more resistant to corrosion. Wire is sold in 3/32 and 1/8-inch diameters.

Check No. 27 on Reply Card for more Details

FOR PRODUCTION OPERATIONS: LK Glenny push broach, announced by Kase Machine Co., Cleveland 19, O., incorporates a special tooth design which facilitates single-pass broaching in many different types of materials. It also features infinitely variable adjustment for depth of cut and interchangeable blades.

Check No. 28 on Reply Card for more Details

VALVE FOR CYLINDERS: For use on pneumatic cylinders, a new, improved speed control valve has been developed by Hannifin Corp., Chicago 24, Ill. It employs a guided poppet of ample diameter to allow full, pipe-size flow toward the cylinder. It provides metered flow away from the cylinder by means of a large diameter, tapered valve stem that is threaded to permit sensitive adjustment from 0 cubic feet per minute to maximum capacity.

Check No. 29 on Reply Card for more Details

CONVERTS CIRCUMFERENCES TO DIAMETERS: Called the Hobby No. 21-P, the new rule announced by Carlson & Sullivan Inc., Monrovia, Calif., converts circumferences into diameters up to 21 inches automatically. All reading is from left to right using only one edge of the tape for final reading.

Check No. 30 on Reply Card for more Details

INDICATORS FOR HIGHER TEMPERATURES: Tempil Corp., New York 11, N. Y., announces the development of high temperature ratings of pellets to indicate 2100, 2200, 2300, 2400 and 2500° F. Beginning with 113° F, pellets are available in 12½ degree steps to 400° F, in 50 degree steps from 400 to 2000° F and in 100 degree steps from 2000 to 2500° F.

Check No. 31 on Reply Card for more Details

FOR INSPECTING: The hand model micrometer, offered by E. J. Cady & Co., Chicago 2, Ill., is designed for easy portability and convenience for inspecting, checking and comparing thicknesses in various locations. Dial is glass covered, 2¾ inches in diameter, graduated in thousandths of an inch. Anvil is 9/16-inch in diameter and permits calipering of thicknesses up to ½-inch on sheet stock or any material requiring accurate thickness measure, including metals.

Check No. 32 on Reply Card for more Details

RECORDS TOTAL PRESSURE: For recording total pressure in the range from 1 micron to 10 mm of mercury, a new recording vacuum gage is offered by National Research Corp., Cambridge, Mass. Ionization is provided by means of alpha particles emanating from an enclosed radium source. The recording Alphatron incorporates either strip or circular chart recorders and full-scale sweeps of 24, 12 or 4½ seconds.

Check No. 33 on Reply Card for more Details

FOR SET SCREW APPLICATIONS: Designed for set screw applications in which excessive vibration is a factor and for regulating and adjustment applications in which instantaneous locking at a precise point is desired, is the new Zip-Grip self-locking screw offered by Set Screw & Mfg. Co., Bartlett, Ill. It does not require any lock nuts, wires, impinging locking screws, deformed or riveted threads.

Check No. 34 on Reply Card for more Details

HANDLE NONFERROUS MATERIAL: Meech Foundry Inc., Cleveland 5, O., announces a new series of Meechite melting pots developed specially for handling nonferrous metals. They are available in almost any size and shape, round or rectangular, with capacities ranging from 50 to more than 10,000 pounds. Pots feature gradual tapering wall thickness and side-angles of slope to resist swelling and distortion.

Check No. 35 on Reply Card for more Details

EXPLOSION-PROOF MOTOR: Squirrel cage, totally enclosed, type CSP, explosion-proof Life Line motors are available from Westinghouse Electric Corp., Pittsburgh 30, Pa. They are available in frames 224 to 326, in 1 to 20 hp ratings, for 2 and 3 phase, 25, 50 and 60 cycle, 208, 220, 440, and 550 v service.

Check No. 36 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Helpful Literature

74. Stainless Steel Application

Allegheny Ludlum Steel Corp.—36-page illustrated brochure is entitled "Allegheny Metal in the Petroleum Industry." Uses of stainless steel in production and processing of oil are depicted and described, and suitable forms of stainless steel and their fabrication are explained.

75. Casting Metals

Dodge Steel Co.—16-page illustrated booklet "Dodge Steel Castings" covers series of carbon and alloy steels for castings. Publication serves as guide in selection as well as source of data on metal specifications, physical and chemical properties and applications.

76. Materials Handling

Aerol Co. — Illustrated manual "Modern Materials Handling Equipment" contains illustrations of all Aerol products and drawings which show how they help to solve particular materials handling problems. Dimensions, load ratings and code numbers are tabulated for quick and easy reference.

77. Parts Fabricating Service

Aluminum Goods Mfg. Co. — 56-page illustrated brochure A-68 outlines production facilities. Described are fabricating plants; aluminum rolling mills; stamping presses; heat treating, die-making and welding equipment; and finishing and shipping facilities.

78. Silent Chain Drive

Whitney Chain & Mfg. Co.—Illustrated catalog No. SCS-49 features stock drive selection tables to simplify ordering and specifying complete chain drive. Silent chain drives are available for applications falling within range of fractional horsepower to well over 50 hp.

79. Industrial Wire Cloth

Buffalo Wire Works Co.—2-page illustrated form No. 602 gives data on diamond mesh fabric woven from galvanized wire which can be installed on galvanized rod, angle iron or channel frame without need for further protective processing such as painting or rustproofing.

80. Portable Power Threader

Beaver Pipe Tools, Inc.—4-page illustrated bulletin is devoted to model-C portable power units and useful information contributed by users of machine. Various applications of machine not related to pipe threading are described also.

81. Industrial Products

American Cyanamid Co.—84-page illustrated book entitled "Products and Services for Industry and Agriculture" depicts products of company and outlines divisional structure through which products are sold.

82. Universal Positioners

Aronson Machine Co.—4-page illustrated folder "Universal Balanced Positioning" covers four universal positioners and special work attachments for balanced positioning of parts for machining or welding. Available in capacities from 200 to 1000 lb, positioner can be converted by power attachments to dual range work plate rotating at any set infinite speed from 0 to 6 rpm.

83. Beading Rolls

Buffalo Forge Co.—24-page illustrated bulletin No. 352-B depicts line of bending rolls for circle segment and spiral bending of angles, tees, channels, flats, tubes, pipes, squares, rounds and special shapes. Capacities and specifications of various machines are listed.

84. Gate Valves

Everlasting Valve Co.—14-page illustrated bulletin No. E-160 presents data on quick-acting nonwedging gate valve which maintains reliable leak-tight seal. Application to blow-off service and on fire protection, chemical process, soot blower, water column blow-down and other types of pipe lines is discussed.

85. Distribution Transformer

Pennsylvania Transformer Co. — 20-page illustrated catalog No. 349 deals with Pole Star distribution transformer that features core wound of cold-rolled steel which has inherent low exciting current. Transformers are made in sizes 25 kva and below, 14,400 v and below for single-phase 60-cycle operation.

86. Pipe Die Drive

Muncie Gear Works, Inc.—4-page illustrated catalog "Save 70% or More in Pipe Threading Costs" shows use of Porta-Drive reversible power unit for pipe threading dies for up to 8-in. pipe. Powered by ½-in. electric or air drill, drive consists of adapter yoke, gear reduction unit and other attachments which fit any standard type of die head.

87. Hardness Testers

Ames Precision Machine Works—6-page illustrated folder "Ames Precision Hardness Tester" covers four models of portable instruments for accurate spot tests which read directly in Rockwell hardness scales. Models range in capacities to 4 in. and handle both round and flat stock.

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88. Briquetted Alloys

Union Carbide & Carbon Corp., Electro Metallurgical Div.—24-page illustrated booklet "Briquetted Alloys for the Iron Foundry Industry" explains how cast iron quality can be improved through addition of briquetted ferro-alloys of silicon, manganese and chromium. Tables of typical cupola charges show how to calculate number of briquettes for soft gray, medium soft, high strength and low chromium iron.

89. Acid Inhibiter

Monsanto Chemical Co.—4-page illustrated bulletin explains function and use of Hibitite acid inhibitor in pickling and cleaning of ferrous metals. Material is excellent aid in producing bright clean products without excessive metal or acid losses. Detailed instructions are given for inhibiting sulphuric, hydrochloric and phosphoric acids.

90. Gear Hobber

Hamilton Tool Co.—4-page illustrated bulletin No. H-00-49 is descriptive of No. 00 gear hobber for high speed continuous hobbing of small precision spur gears, pinions and special tooth forms. Features and specifications are listed, and typical parts produced are depicted.

91. Safety Program

American Optical Co.—16-page illustrated booklet entitled "How to Set up and Conduct a Safety Eye Program" contains information useful to any concern planning to establish or expand program of eye safety through use of prescription safety goggles.

92. Standard Measuring Machine

Pratt & Whitney Div., Niles-Bement-Pond Co.—8-page illustrated circular No. 823 describes precision measuring instrument which is used as means of checking gages, tools and parts for diameter, length, roundness, straightness, parallelism and taper to 0.00001-in. Features and specifications are listed and accessories shown.

93. Clutch-Brake Unit

Clearing Machine Corp.—4-page illustrated bulletin 218 presents Tornadyne clutch and brake unit for power presses which features power saving and speed of response because of low mass of parts that start with every stroke. Since these parts rotate with drive pinion, their relatively high speed multiplies effect of their inertia and reduces total power required to put slide in motion.

94. Timing Relay

Allen-Bradley Co.—1-page illustrated catalog sheet describes bulletin 849 pneumatic timing relay which can be obtained for either alternating or direct current. Range is easily adjustable from 10 cycles to 3 minutes with accuracy of plus or minus 10 per cent. Unit can be changed from on-delay to off-delay operation by inverting solenoid.

95. Metal Powders

National Radiator Co., Plastic Metals Div.—4-page illustrated bulletin No. 567 describes important applications for iron, steel, nickel, manganese and silicon powders. Items which can be made from these powders include gears, bearings, toy locomotive wheels, bushings, magnets and magnetic cores.

96. Rolling Doors

Cornell Iron Works, Inc.—12-page illustrated catalog No. E-27 portrays rolling and sliding steel grilles, moving stairway enclosures, side rolling partitions and special upward acting doors for variety of industrial uses. Built of wood or interlocking steel slats, door is stiff against pressure but flexible when rolled.

97. Thread Milling Machine

James Coulter Machine Co.—4-page illustrated circular "The Threadmaster" describes model T24 machine for milling precision threads from 1/3 to 20 per in. and leads from 0.05 to 5.5 in. on production basis. Work spindle with standard equipment affords 59 speed changes and is driven with worm and gear.

98. Custom Steel Fabrications

Morgan Steel Products, Inc.—4-page illustrated circular "Custom Steel Fabricators" depicts and describes facilities for producing odd and large size pipe, bins, tanks, chutes, smokestacks, hoppers, bunkers, breechings, stainless steel products and all types of ferrous alloy products.

99. Corrosion Resistant Cement

Pennsylvania Salt Mfg. Co., Special Chemicals Dept.—Chart shows resistance of both resin and silicate cements to various corrosive chemicals and is designed to aid masonry construction trade in selecting proper cement for industrial use. Resistance of Pennsalt PRF, Asplit, Causplit, Pennsalt HF and Panchlor acidproof cement to 250 chemicals is listed.

100. Portable Floodlight

Natale Machine & Tool Co.—2-page illustrated catalog sheet depicts Circle D-150 emergency portable floodlight that can use interchangeable 200, 300 or 500-w sealed beam lamps. Applications include night construction work, shipyard use, emergency field work and portable airport lighting.

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13	33	53	73	93
14	34	54	74	94
15	35	55	75	95
16	36	56	76	96
17	37	57	77	97
18	38	58	78	98
19	39	59	79	99
20	40	60	80	100

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Market Summary

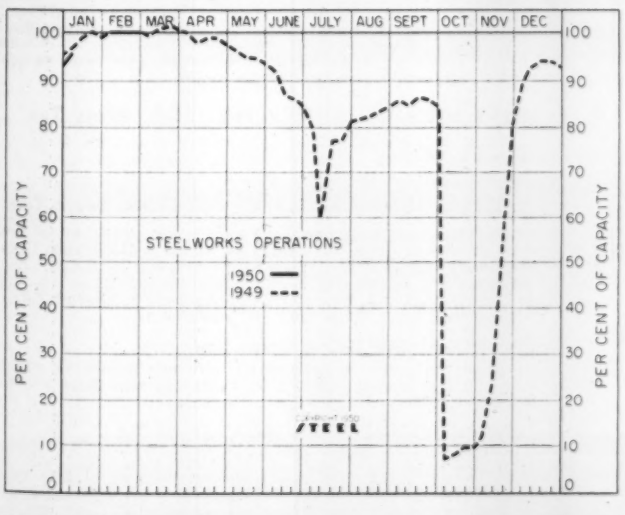
PRICES on hard goods are beginning to rise under the impact of the steel advances initiated in December. Higher costs are being passed along to ultimate consumers, in some cases. Indicative of the trend, industrial fastener manufacturers are revising discount lists, partially compensating for steel cost increases, which, in some instances, amount to as much as $22 per ton. Other durable goods makers, such as hardware interests, are expected to take similar action once they have fully analyzed the higher steel costs. Warehouse distributors are marking up their quotations, revising quantity brackets and extra charges.

STEEL PRICES—While the steel market is firmly established on the higher price level all producers have not yet issued new schedules. Consequently, the market still is in a somewhat fluid state, isolated advances continuing almost daily. It will take several more weeks before adjustments are completed and the market becomes solidified. Last week tool steel producers revised prices upward about 10 per cent. Small makers of cold-finished bars also announced increases.

COMPOSITES—STEEL's weighted index for finished steel last week eased to 156.13 from the revised index of 156.88 the preceding week. This largely reflects the reduction in tin mill product prices that became effective Jan. 1. It compares with 152.52 a month ago and 155.05 a year ago. The arithmetical price composite for finished steel increased to $92.41 from $92.18, reflecting upward adjustments by many of the smaller producers who had been quoting below the general market. A month ago this composite stood at $91.64, and a year ago at $95.50. Pig iron composites held unchanged with basic, $45.60, No. 2 foundry, $46.10 and malleable, $47.27. The price composite on steelmaking scrap eased for the seventh consecutive week, dropping to $26.83 from $26.92 the preceding week, and comparing with $42.58 a year ago.

REACTION—Buyers are struggling with the new extra cards to determine their cost position. It may be some time before adjustments in manufactured goods are completed, since such factors as manufacturing practice, design and buying and selling policies enter into determination of price schedules. Revamping of practices to avoid higher steel extras and accommodate production to more economical methods may take time. In connection with bolts and nuts, one leading manufacturer has taken the occasion to inaugurate a radical change in pricing, the first in the industry in many years. Its new discount list not only takes cognizance of the rise in steel prices, but also advances in manufacturing methods and changes in shipping practice. Its new schedule eliminates so-called chain discounts which have been in vogue in the industry for many years, making for greater simplification in pricing.

DEMAND—Light, flat-rolled products and pipe start off the new year in active demand. Bar and wire specifications also are a little more pressing. Plates and shapes are sluggish. Prospects for a spring pickup in structural materials are promising. Inquiry for the latter is reported broadening though fabricators are competing sharply for tonnage in an effort to prevent further shrinkage in order backlogs. Competition is extremely keen in the plate market. Some freight absorption by the mills is reported in the fight for tonnage. Plates are available for delivery in three to four weeks. Bar order backlogs are a shade heavier with mill shipments ranging from five to eight weeks. Little change in pressure for cold-rolled and galvanized sheets is noted with consumers striving to get tonnage on mill books despite extended deliveries. Specialties, such as stainless and alloy sheets, are in only modest demand.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Jan. 7	Change	Same Week 1949	Same Week 1948
Pittsburgh	96.5	None*	96	101
Chicago	98	+ 2*	99	93
Eastern Pa.	86	+ 8	95	92
Youngstown	102	None	105	103
Wheeling	98†	1.5	90	93.5
Cleveland	98†	+ 2.5*	94.5	89
Buffalo	103.5	None	104	88.5
Birmingham	100	None	100	99
New England	80	— 1	85	80
Cincinnati	106	+ 2	99	86
St. Louis	89.5	None	84.5	89.5
Detroit	109	+11	99	90
Western	83	— 4	..	..
Estimated national rate	96.5	+ 3	97.5	97

Based on weekly steelmaking capacity of 1,843,516 net tons for 1950 and 1949; 1,802,476 net tons for 1948.

*Change from revised rate. †Capacity basis revised.

News Summary—p. 15 Production-Engineering News—p. 45

Composite Market Averages

	Jan. 5 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	156.13	156.88	152.52	155.05	100.32
Index in cents per lb ..	4.230	4.250	4.132	4.200	2.718
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$92.41	$92.18	$91.64	$97.68	$56.73
No. 2 Fdry Pig Iron, GT	46.10	46.10	46.10	46.69	23.67
Malleable Pig Iron, GT..	47.27	47.27	47.27	47.41	24.29
Basic Pig Iron, GT	45.60	45.60	45.60	46.29	23.00
Steelmaking Scrap, GT..	26.83	26.92	29.83	42.58	19.17

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Jan. 5 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh...	3.45	3.45	3.35	3.35–55	2.15
Bars, H.R., Chicago	3.45	3.35	3.35	3.35	2.15
Bars, C.F., Pittsburgh	4.10-4.15	3.95-4.00	3.95-4.00	3.95-4.25	2.65
Bars, C.F., Chicago.....	4.00	4.00	4.00	4.00	2.65
Shapes, Std., Pittsburgh ..	3.40	3.40	3.25	3.25–30	2.10
Shapes, Std., Chicago	3.40	3.25	3.25	3.25	2.10
Plates, Pittsburgh	3.50	3.50	3.40	3.40–60	2.10
Plates, Chicago	3.50	3.40	3.40	3.40	2.10
Plates, Coatesville, Pa. ..	3.60	3.60	3.50	3.75	2.10
Plates, Sparrows Point, Md.	3.50	3.50	3.40	3.45	2.10
Plates, Claymont, Del.	3.60	3.50	3.50	3.95	2.10
Sheets, H.R., Pittsburgh ..	3.35	3.35	3.25	3.25–30	2.10
Sheets, H.R., Chicago	3.35	3.25	3.25	3.25	2.10
Sheets, C.R., Pittsburgh ..	4.10	4.10	4.00	4.00	3.05
Sheets, C.R., Chicago.....	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Detroit	4.20	4.20	4.20	4.20	3.15
Sheets, Galv., Pittsburgh..	4.40	4.40	4.40	4.40	3.50
Strip, H.R., Pittsburgh ...	3.25	3.25	3.25	3.25–70	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25–30	2.10
Strip, C.R., Pittsburgh....	4.15	4.15	4.00	4.00–75	2.80
Strip, C.R., Chicago	4.00–15	4.00–15	4.00–15	4.00–25	2.90
Strip, C.R., Detroit	4.20–40	4.20–25	4.20–25	4.20–50	2.90
Wire, Basic, Pittsburgh ...	4.50	4.50	4.15	4.15–4.50	2.60
Nails, Wire, Pittsburgh ...	5.30	5.30	5.15	5.15–6.30	2.55
Tin plate, box, Pittsburgh.	$7.50	$7.75	$7.75	$6.70	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$63.00	$63.00	$61.00	$61.00	$40.00
Sheet bar, mill (NT)	51.78–57.00	51.78–57.00	51.78–57.00	67.00	34.00
Wire rods, $\frac{7}{32}$-$\frac{3}{8}$", Pitts. ..	3.85	3.85	3.40	3.40–4.15	2.00

PIG IRON, Gross Ton

Bessemer, Pitts.	$47.00	$47.00	$47.00	$47.00	$24.50
Basic, Valley	46.00	46.00	46.00	46.00	23.50
Basic, del. Phila.	49.44	49.44	49.44	50.17	25.34
No. 2 Fdry, Pitts.	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, Chicago	46.50	46.50	46.50	46.00–46.50	24.00
No. 2 Fdry, Valley	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, del. Phila. ...	49.94	49.94	49.94	50.67	25.84
No. 2 Fdry, Birmingham..	39.38	39.38	39.38	43.38	20.38
No. 2 Fdry.(Birm.)del Cin.	46.08	46.08	46.08	49.09	24.06
Malleable, Valley	46.50	46.50	46.50	46.50	24.00
Malleable, Chicago	46.50	46.50	46.50	46.50	24.00
Charcoal, Lyles, Tenn.	60.00	60.00	60.00	66.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	163.00	140.33*

* Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts. ..	$30.00	$30.00	$32.00	$42.75	$21.00
No. 1 Heavy Melt. E. Pa. .	23.50	23.75	24.75	45.25	18.75
No. 1 Heavy Melt. Chicago	27.00	27.00	29.00	41.75	19.75
No. 1 Heavy Melt. Valley..	30.25	30.25	32.75	42.75	20.00
No. 1 Heavy Melt. Cleve..	27.25	27.25	30.25	42.25	19.50
No. 1 Heavy Melt. Buffalo	27.75	29.75	29.75	48.50	19.25
Rails, Rerolling, Chicago..	39.50	41.50	43.50	69.50	22.25
No. 1 Cast, Chicago.....	38.50	38.50	42.50	67.50	20.00

COKE, Net Ton

Beehive, Furn., Connlsvl. .	$13.25	$13.25	$13.25	$14.50	$7.00
Beehive, Fdry., Connlsvl. .	15.50	15.50	15.75	17.00	7.75
Oven Fdry., Chicago	20.00	20.00	20.00	20.40	13.35

NONFERROUS METALS

Copper, del. Conn.	18.50	18.50	18.50	23.50	12.00
Zinc, E. St. Louis.....	9.75-10.00	9.75-10.00	9.75	17.50	8.25
Lead, St. Louis	11.80	11.80	11.80	21.30–35	6.35
Tin, New York	77.50	77.50	80.75	103.00	52.00
Aluminum, del.	17.00	17.00	17.00	17.00	15.00
Antimony, Laredo, Tex. ..	32.00	32.00	32.00	38.50	14.50
Nickel, refinery, duty paid.	40.00	40.00	40.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$48.00	$48.50	$49.00	$49.50
Newark, del.	50.63	51.13	51.63	52.13
Brooklyn, N.Y., del.	....	52.79	53.29	....
Birmingham District				
Birmingham, Ala. R2, S9	38.88	39.38	....	....
Woodward, Ala. W15	38.88	39.38	....	....
Cincinnati, del.	....	46.08	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawanda, N.Y. W12	46.00	46.50	47.00	....
N. Tonawanda, N.Y. T9	....	46.50	47.00	....
Boston, del.	55.26	55.76	56.20	....
Rochester, N.Y., del.	48.63	49.13	49.63	....
Syracuse, N.Y., del.	49.58	50.08	50.58	....
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary, Ind. C3	46.00	....	46.50	....
IndianaHarbor, Ind. I-2	46.00	....	46.50	....
So. Chicago, Ill. W14	46.00	46.50	46.50	....
So. Chicago, Ill. C3	46.00	....	46.50	47.00
So. Chicago, Ill. Y1	46.00	46.50	46.50	....
Milwaukee, del.	47.89	48.39	48.39	48.89
Muskegon, Mich., del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Lorain, O. N3	46.00	....	....	47.00
Duluth I-3	....	....	46.50	....
Erie, Pa. I-3	46.00	46.50	46.50	47.00
Everett, Mass. E1	....	50.50	51.00	....
Fontana, Calif. K1	52.00	52.50	....	....
Geneva, Utah G1	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.20	....	....
Portland, Oreg., del.	....	54.20	....	....
LosAngeles, SanFrancisco, del.	53.70	54.20	....	....
GraniteCity, Ill. M10	47.90	48.40	48.90	....
St. Louis, del. (incl. tax)	48.65	49.15	49.65	....
Ironton, Utah C11	46.00	46.50	....	....
Minnequa, Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
NevilleIsland, Pa. P6	46.00	46.50	46.50	47.00
Pitts. N.&S. sides, Ambridge, Aliquippa, del.	47.19	47.69	47.69	48.19
McKeesRocks, del.	46.95	47.45	47.45	47.95
Lawrenceville, Homestead, McKeesport, Monaca, del.	47.44	47.94	47.94	48.44
Verona, del.	47.90	48.40	48.40	48.90
Brackenridge, del.	48.13	48.63	48.63	49.13
Bessemer, Pa. C3	46.00	....	46.50	47.00
Clairton, Rankin, So. Duquesne, Pa. C3	46.00	....	....	....
McKeesport, Pa. N3	46.00	....	....	47.00
Sharpsville, Pa. S6	46.00	46.50	46.50	47.00
Steelton, Pa. B2	48.00	48.50	49.00	49.50
Steubenville, O. W10	46.00	....	....	....
Struthers, O. S16	46.00	....	....	....
Swedeland, Pa. A3	48.00	48.50	49.00	49.50
Philadelphia, del.	49.44	49.94	50.44	50.94
Toledo, O. I-3	46.00	46.50	46.50	47.00
Cincinnati, del.	51.01	51.51	....	....
Troy, N.Y. R2	48.00	48.50	49.00	....
Youngstown District				
Hubbard, O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.26	50.76	50.76	51.26

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; Add $1 for each 0.5% Si to 11.50%)

Jackson, O. J1, G2	$59.50
Buffalo H1	60.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls, N.Y. P15	$71.50
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	77.00
Keokuk, Iowa, OH & Fdry., 12½ lb. piglets, frt. allowed K2.	82.00
Wenatchee, Wash., OH & Fdry, frt. allowed K2.	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos, semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$60.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, Intermediate, A7	$51.00
Steelton, Pa. B2	54.00
Philadelphia delivered	57.00
Troy, N.Y. R2	54.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL, Jan. 5, 1950; cents per pound unless otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Detroit R7 ..... $50.00
Munhall,Pa. C3 ..... 50.00

INGOTS, Alloy (NT)
Detroit R7 ..... $51.00
Houston,Tex. S5 ..... 59.00
Midland,Pa. C18 ..... 51.00
Munhall,Pa. C3 ..... 51.00
So.Duquesne,Pa. C3 ... 51.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. C3 ..... $53.00
Clairton,Pa. C3 ..... 53.00
Conshohocken,Pa. A3 ... 58.00
Ensley,Ala. T2 ..... 53.00
Farfield,Ala. T2 ..... 53.00
Fontana,Cal. K1 ..... 72.00
Gary,Ind. C3 ..... 53.00
Johnstown,Pa. B2 ..... 53.00
Lackawanna,N.Y. B2 .. 53.00
Munhall,Pa. C3 ..... 53.00
Sharon,Pa. S3 ..... 57.00
So.Chicago,Ill. C3 .... 53.00
So.Duquesne,Pa. C3 ... 53.00

Carbon, Forging (NT)
Bessemer,Pa. C3 ..... $63.00
Buffalo R2 ..... 63.00
Canton,O. R2 ..... 63.00
Clairton,Pa. C3 ..... 63.00
Cleveland R2 ..... 63.00
Conshohocken,Pa. A3 ... 65.00
Detroit R7 ..... 61.00
Ensley,Ala. T2 ..... 63.00
Fairfield,Ala. T2 ..... 63.00
Fontana,Calif. K1 ..... 82.00
Gary,Ind. C3 ..... 63.00
Geneva,Utah G1 ..... 63.00
Houston,Tex. S5 ..... 69.00
Ind.Harbor,Ind. I-2 .... 63.00
Johnstown,Pa. B2 .... 63.00
Lackawanna,N.Y. B2 .. 63.00
Munhall,Pa. C3 ..... 63.00
So.Duquesne,Pa. C3 .... 63.00
So.Chicago C3 R2 W14 .. 63.00
Warren,O. C17 ..... 63.00

Alloy (NT)
Bethlehem,Pa. B2 .... $66.00
Buffalo R2 ..... 66.00
Canton,O. R2 ..... 66.00
Canton,O. T7 ..... 66.00
Conshohocken,Pa. A3 .. 65.00
Detroit R7 ..... 63.00
Fontana,Calif. K1 .... 82.00
Gary,Ind. C3 ..... 63.00
Houston,Tex. S5 ..... 71.00
Johnstown,Pa. B2 .... 63.00
Lackawanna,N.Y. B2 .. 66.00
Massillon,O. R2 ..... 66.00
Midland,Pa. C18 ..... 66.00
Munhall,Pa. C3 ..... 63.00
Sharon,Pa. S3 ..... 66.00
So.Chicago,Ill. R2 W14 .. 66.00
So.Chicago,Ill. C3 .... 63.00
So.Duquesne,Pa. C3 ... 63.00
Warren,O. C17 ..... 66.00

SHEET BARS (NT)
Mansfield,O. E6 (GT) .. $58.00
Sharon,Pa. S3 ..... 57.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 ..... $76.00
Cleveland R2 ..... 76.00
Ind.Harbor,Ind. I-2 ... 76.00
Massillon,O. R2 ..... 76.00
So.Chicago,Ill. R2 .... 76.00

SKELP
Aliquippa,Pa. J5 ..... 3.15
Munhall,Pa. C3 ..... 3.15
Warren,O. R2 ..... 3.15
Youngstown C3, R2 .... 3.15

WIRE RODS
AlabamaCity,Ala. R2 ... 3.85
Buffalo W12 ..... 3.40
Cleveland A7 ..... 3.85
Donora,Pa. A7 ..... 3.85
Fairfield,Ala. T2 ..... 3.85
Houston,Tex. S5 ..... 3.95
Ind.Harbor,Ind. Y1 .... 3.85
Johnstown,Pa. B2 ..... 3.85
Joliet,Ill. A7 ..... 3.85
Los Angeles B3 ..... 4.20
Monessen,Pa. P7 ..... 3.85
Pittsburg,Calif. C11 .... 4.50
Portsmouth,O. P12 .... 3.40
Roebling,N.J. R5 ..... 3.95
So.Chicago,Ill. R2 .... 3.85
SparrowsPoint B2 ..... 3.95
Sterling,Ill.(1) N15 .... 3.85
Struthers,O. Y1 ..... 3.85
Torrance,Calif. C11 .... 4.65
Worcester,Mass. A7 .... 4.15

STRUCTURALS
Wide Flange
Bethlehem,Pa. B2 ..... 3.45
Lackawanna,N.Y. B2 ... 3.45
Munhall,Pa. C3 ..... 3.40
So.Chicago,Ill. C3 .... 3.40
H-S, L-A. Wide Flange
Munhall,Pa. C3 ..... 5.10

H.-S. Low-Alloy
Stand. Shapes
Aliquippa,Pa. J5 ..... 5.15
Bessemer,Ala. T2 ..... 5.15
Bethlehem,Pa.(14) B2 .. 5.20
Clairton,Pa. C3 ..... 5.15
Fairfield,Ala. T2 ..... 5.15
Fontana,Calif. K1 ..... 5.75
Gary,Ind. C3 ..... 5.15
Ind.Harbor,Ind. I-2 ... 5.15
Ind. Harbor,Ind Y1 .... 5.15
Johnstown,Pa. B2 ..... 5.20
Lackawanna,N.Y.(14)B2 5.20
Munhall,Pa.(14) C3 .... 5.15
So.Chicago,Ill.(14) C3 .. 5.15
Struthers,O. Y1 ..... 5.15

Carbon Steel Stand. Shapes
Aliquippa,Pa. J5 ..... 3.40
Bessemer,Ala. T2 ..... 3.40
Bethlehem,Pa. B2 ..... 3.45
Clairton,Pa. C3 ..... 3.40
Fairfield,Ala. T2 ..... 3.40
Fontana,Calif. K1 ..... 4.00
Gary,Ind. C3 ..... 3.40
Geneva,Utah G1 ..... 3.40
Houston,Tex. S5 ..... 3.65
Ind.Harbor,Ind. I-2 ... 3.40
Johnstown,Pa. B2 ..... 3.30
KansasCity,Mo. S5 .... 3.85
Lackawanna,N.Y. B2 ... 3.30
LosAngeles B3 ..... 4.00
Minnequa,Colo. C10 .... 3.75
Munhall,Pa. C3 ..... 3.40
Niles,Calif. (22) P1 .... 3.97
Phoenixville,Pa. P4 .... 3.30
Portland,Oreg. O4 ..... 3.90
Seattle B3 ..... 4.05
So.Chicago,Ill. C3 ..... 3.40
So.Chicago,Ill. W14 ..... 3.40
So.SanFrancisco B3 .... 3.95
Torrance,Calif. C11 .... 4.00
Weirton,W.Va. W6 .... 3.40

Alloy Stand. Shapes
Clairton,Pa. C3 ..... 4.05
Fontana,Calif. K1 ..... 5.25
Munhall,Pa. C3 ..... 4.05
So.Chicago,Ill. C3 ..... 4.05

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ... 4.20
Lackawanna,N.Y. B2 .. 4.05
Munhall,Pa. C3 ..... 4.20
So.Chicago,Ill. C3 ..... 4.20
Weirton,W.Va. W6 .... 4.05

PLATES, Carbon Steel
AlabamaCity,Ala. R2 .. 3.50
Aliquippa,Pa. J5 ..... 3.50
Ashland,Ky.(15) A10 ... 3.50
Bessemer,Ala. T2 ..... 3.50
Clairton,Pa. C3 ..... 3.50
Claymont,Del. W16 .... 3.60
Cleveland J5, R2 ..... 3.50
Coatesville,Pa. L7 ..... 3.60
Conshohocken,Pa. A3 ... 3.60
Ecorse,Mich. G5 ..... 3.75
Fairfield,Ala. T2 ..... 3.50
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.50
Geneva,Utah G1 ..... 3.50
Harrisburg,Pa. C5 ..... 3.50
Houston,Tex. S5 ..... 3.80
Ind.Harbor,Ind. I-2 ... 3.50
Ind.Harbor,Ind Y1 .... 3.50
Johnstown,Pa. B2 ..... 3.50
Lackawanna,N.Y. B2 ... 3.50
Minnequa,Colo. C10 .... 4.30
Munhall,Pa. C3 ..... 3.50
Pittsburgh J5 ..... 3.50
Seattle B3 ..... 4.40
Sharon,Pa. S3 ..... 3.50
So.Chicago,Ill. W14 ..... 3.50
So.Chicago,Ill. C3 .... 3.50
SparrowsPoint,Md. B2 .. 3.50
Steubenville,O. W10 ... 3.50
Warren,O. R2 ..... 3.50
Weirton,W.Va. W6 .... 3.50
Youngstown C3, Y1 .... 3.50

PLATES (Universal Mill)
Fontana,Calif. K1 ..... 4.40

PLATES, Open-Hearth Alloy
Coatesville,Pa. L7 ..... 4.50
Conshohocken,Pa. A3 .. 4.40
Fontana,Calif. K1 ..... 5.40
Gary,Ind. C3 ..... 4.40
Johnstown,Pa. B2 ..... 4.40
Munhall,Pa. C3 ..... 4.40
Sharon,Pa. S3 ..... 4.40
So.Chicago,Ill. C3 ..... 4.40
SparrowsPoint,Md. B2 .. 4.40

PLATES, Ingot Iron
Ashland,cl(15) A10 ..... 3.75
Ashland,lcl(15) A10 ..... 4.25
Cleveland,cl R2 ..... 4.10
Warren,O.,cl R2 ..... 4.10

PLATES, Wrought Iron
Economy,Pa. B14 ..... 7.85

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ..... 5.35
Bessemer,Ala. T2 ..... 5.35
Clairton,Pa. C3 ..... 5.35
Cleveland J5, R2 ..... 5.35
Conshohocken,Pa. A3 ... 5.35
Ecorse,Mich. G5 ..... 5.60
Fairfield,Ala. T2 ..... 5.35
Fontana,Calif. K1 ..... 5.95
Gary,Ind. C3 ..... 5.35
Geneva,Utah G1 ..... 5.35
Houston,Tex. S5 ..... 5.60
Ind.Harbor,Ind. I-2 ... 5.35
Ind.Harbor,Ind. Y1 .... 5.35
Johnstown,Pa. B2 ..... 5.35
Munhall,Pa. C3 ..... 5.35
Pittsburgh J5 ..... 5.35
Sharon,Pa. S3 ..... 5.35
So. Chicago,Ill C3 ..... 5.35
SparrowsPoint,Md. B2 .. 5.35
Warren,O. R2 ..... 5.35
Youngstown Y1 ..... 5.35

FLOOR PLATES
Cleveland J5 ..... 4.55
Conshohocken,Pa. A3 ... 4.55
Harrisburg,Pa. C5 .... 4.55
Ind.Harbor,Ind. I-2 ... 4.55
Munhall,Pa. C3 ..... 4.55
So.Chicago,Ill. C3 ..... 4.55

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ... 3.45
Aliquippa,Pa. J5 ..... 3.45
Alton,Ill. (1) L1 ..... 3.35
Ashland,Ky.(17) A10 ... 3.45
Atlanta,Ga. A11 ..... 3.50
Bessemer,Ala. T2 ..... 3.45
Buffalo R2 ..... 3.45
Canton,O. R2 ..... 3.45
Clairton,Pa. C3 ..... 3.45
Cleveland R2 ..... 3.45
Ecorse,Mich. G5 ..... 3.65
Emeryville,Calif. J7 .... 4.10
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.45
Houston,Tex. S5 ..... 3.75
Ind.Harbor,Ind. I-2 ... 3.45
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 ..... 3.95
Lackawanna,N.Y. B2 ... 3.45
LosAngeles B3 ..... 4.15
Marion,O. P11 ..... 3.35
Midland,Pa. C18 ..... 3.45
Milton,Pa. B6 ..... 3.45
Minnequa,Colo. C10 .... 3.85
Niles,Calif. P1 ..... 4.05
N.Tonawanda,N.Y. B11 .. 3.35
Pittsburg,Calif. C11 .... 4.15
Pittsburgh, J5 ..... 3.45
Porland,Oreg. O4 ..... 4.10
Seattle B3, N14 ..... 4.20
So.Chicago C3, R2 ..... 3.45
So.Chicago,Ill. W14 ..... 3.45
So.Duquesne,Pa. C3 ... 3.45
S.SanFran.,Cal. B3 .... 4.20
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 .... 4.15
Weirton,W.Va. W6 .... 3.45
Youngstown C3, R2 ... 3.45

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 ..... 3.45
Atlanta A11 ..... 3.60
Bethlehem,Pa.(2) B2 ... 3.65
Johnstown,Pa. B2 .... 3.35
Lackawanna,N.Y. B2 ... 3.35
Niles,Calif. P1 ..... 4.05
Pittsburgh(23) J5 ..... 3.45
Portland,Oreg. O4 ..... 4.10
SanFrancisco S7 ..... 3.90
Weirton,W.Va. W6 .... 3.35

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ..... 3.95
Buffalo R2 ..... 3.95
Canton,O. R2 ..... 3.95
Canton,O. T7 ..... 3.95
Clairton,Pa. C3 ..... 3.95
Ecorse,Mich. G5 ..... 4.25
Fontana,Calif. K1 ..... 4.95
Gary,Ind. C3 ..... 3.95
Houston,Tex. S5 ..... 4.15
Ind.Harbor,Ind. I-2 ... 3.95
Ind.Harbor,Ind. Y1 .... 3.95
Johnstown,Pa. B2 ..... 3.95
KansasCity,Mo. S5 .... 4.35
Lackawanna,N.Y. B2 ... 3.95
LosAngeles B3 ..... 5.00
Massillon,O. R2 ..... 3.95
Midland,Pa. C18 ..... 3.95
So.Chicago C3, R2 .... 3.95
So.Chicago,Ill. W14 ..... 3.95
So.Duquesne,Pa. C3 ... 3.95
Struthers,O. Y1 ..... 3.95
Warren,O. C17 ..... 3.95
Youngstown C3 ..... 3.95

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. C3 ..... 4.20
Fontana,Calif. K1 ..... 4.95
Gary,Ind. C3 ..... 4.20
Youngstown C3 ..... 4.20

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ..... 5.20
Bessemer,Ala. T2 ..... 5.20
Bethlehem,Pa. B2 ..... 5.20
Clairton,Pa. C3 ..... 5.20
Cleveland R2 ..... 5.20
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.20
Fontana,Calif. K1 ..... 6.25
Gary,Ind. C3 ..... 5.20
Ind.Harbor,Ind. Y1 .... 5.20
Ind.Harbor,Ind. I-2 ... 5.20
Johnstown,Pa. B2 ..... 5.20
Lackawanna,N.Y. B2 ... 5.20
Pittsburgh J5 ..... 5.20
So.Duquesne,Pa. C3 .. 5.20
Struthers,O. Y1 ..... 5.20
Youngstown C3 ..... 5.20

BARS, Cold-Finished Carbon
Aliquippa,Pa. K5 ..... 4.15
Ambridge,Pa. W18 .... 4.15
BeaverFalls,Pa. M12 ... 4.15
BeaverFalls,Pa. R2 ..... 4.15
Buffalo B5 ..... 4.00
Camden,N.J. P13 ..... 4.63
Carnegie,Pa. C12 ..... 4.15
Chicago W18 ..... 4.15
Cleveland A7, C20 ..... 4.15
Cumberland,Md. C19 ... 3.95
Detroit P17 ..... 4.15
Donora,Pa. A7 ..... 4.15
Hammond,Ind. L2, M13 .. 4.15
Hartford,Conn. R2 .... 4.55
Harvey,Ill. B5 ..... 4.00
LosAngeles R2 ..... 5.55
Mansfield,Mass. B5 .... 4.55
Massillon,O. R2, R8 ... 4.15
Midland,Pa. C18 ..... 4.00
Monaca,Pa. S17 ..... 4.15
Newark,N.J. W18 ..... 4.55
Plymouth,Mich. P5 ..... 4.40
Pittsburgh J5 ..... 4.10
Putnam,Conn. W18 .... 4.55
Readville,Mass. C14 .... 4.55
St.Louis,Mo. M5 ..... 4.55
So.Chicago,Ill W14 .... 4.00
SpringCity,Pa.(5) K3 .. 4.48
Struthers,O. Y1 ..... 4.00
Waukegan,Ill. A7 ..... 4.15
Youngstown F3 ..... 4.15
Youngstown Y1 ..... 4.00

BARS, Cold-Finished Alloy
Aliquippa,Pa. K5 ..... 4.65
Ambridge,Pa. W18 ..... 4.90
BeaverFalls,Pa. M12.... 4.65
Bethlehem,Pa. B2 ..... 4.65
Buffalo B5 ..... 4.65
Canton,O. R2 ..... 4.90
Carnegie,Pa. C12 ..... 4.90
Chicago W18 ..... 4.90
Cleveland A7, C20 .... 4.65
Detroit P17 ..... 4.80
Donora,Pa. A7 ..... 4.65
Elyria,O. W8 ..... 4.65
Gary,Ind. R2 ..... 4.65
Hammond,Ind. L2 ..... 4.65
Hammond,Ind. M13 ..... 4.90
Hartford,Conn. R2 ..... 5.20
Harvey,Ill B5 ..... 4.65
Lackawanna,N.Y. B2 .. 4.65
Mansfield,Mass. B5 .... 4.95
Massillon,O. R2, R8 ... 4.90
Midland,Pa. C18 ..... 4.65
Monaca,Pa. S17 ..... 4.65
Newark,N.J. W18 ..... 5.20
So.Chicago,Ill. R2 ..... 4.90
So.Chicago,Ill W14 .... 4.65
Struthers,O. Y1 ..... 4.65
Waukegan,Ill. A7 ..... 4.65
Worcester,Mass. A7 .... 4.95
Youngstown F3, Y1 .... 4.65

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ... 3.45
Alton,Ill.(6) L1 ..... 3.35
Atlanta,Ga. A11 ..... 3.60
Buffalo R2 ..... 3.45
Cleveland R2 ..... 3.45
Emeryville,Calif. J7 .... 4.10
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.45
Houston,Tex. S5 ..... 3.75
Ind.Harbor,Ind. I-2 ... 3.45
Ind.Harbor,Ind. Y1 .... 3.45
Johnstown,Pa. B2 ..... 3.45
KansasCity, Mo. S5 .... 3.95
Lackawanna,N.Y. B2 ... 3.45
LosAngeles B3 ..... 4.05
Minnequa,Colo. C10 .... 4.25
Niles,Calif. P1 ..... 4.05
Pittsburgh J5 ..... 3.45
Portland,Oreg. O4 ..... 4.10
Seattle,Wash. B3, N14 .. 4.20
So.Chicago,Ill R2 ..... 3.45
So.Duquesne,Pa. C3 .... 3.45
So.SanFrancisco B3 .... 4.10
SparrowsPoint,Md. B2 .. 3.45
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 .... 4.15
Youngstown C3, R2 .... 3.45

BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 .. 4.50
Johnstown, ¼-1" B2 ... 4.25
LosAngeles B3 ..... 5.00
Marion,O. P11 ..... 4.25
Pittsburgh J5 ..... 4.25
Seattle B3, N14 ..... 5.00
So.SanFrancisco B3 .... 5.00
SparrowsPt., 1⅛-1¼" B2. 4.83
SparrowsPt., ¼-1" B2 .. 4.25

RAIL STEEL BARS
ChicagoHts.,Ill.(3) I-2.. 3.30
ChicagoHts.,Ill.(4) I-2.. 3.45
FortWorth,Tex.(26) T4.. 4.33
Huntgtn,W.Va.(3) W7 ... 3.45
Moline,Ill.(3) R2 ..... 3.35
Williamsport(2,3) S19.. 3.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14.9.50
Economy,Pa.(D.R.)B14 11.00
Economy(Stablt) B14..11.30
McK.Rks.(S.R.) L5 .... 8.60
McK.Rks.(D.R.) L5.... 11.25
McK.Rks.(Staybolt) L5.12.75

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ... 3.35
Ashland,Ky.(8) A10 ..... 3.35
Butler,Pa. A10 ..... 3.35
Cleveland J5, R2 ..... 3.35
Conshohocken,Pa. A3 ..... 3.45
Ecorse,Mich.(8) G5 ..... 3.55
Fairfield,Ala. T2 ..... 3.35
Fontana,Calif. K1 ..... 4.25
Gary,Ind. C3 ..... 3.35
Ind.Harbor,Ind. I-2 ... 3.35
Ind.Harbor, Ind. Y1 .... 3.35
Irvin,Pa. C3 ..... 3.35
Kokomo,Ind. C16 ..... 3.35
Lackawanna,N.Y. B2 .. 3.35
Munhall,Pa. C3 ..... 3.35
Niles,O. M4 ..... 3.35
Pittsburg,Calif. C11 .... 4.05
Pittsburgh J5 ..... 3.35
Sharon,Pa. S3 ..... 3.35
So.Chicago,Ill. W14 ..... 3.35
SparrowsPoint,Md. B2 .. 3.35
Steubenville,O. W10 ... 3.35
Torrance,Calif. C11 .... 4.05
Warren,O. R2 ..... 3.35
Weirton,W.Va. W6 .... 3.35
Youngstown C3, Y1 .... 3.35

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity, Ala. R2 .. 4.50
Dover,O. R1 ..... 5.00
Ind.Harbor,Ind. I-2 .... 4.40
Mansfield,O. E6 ..... 4.15
Niles,O. N12 ..... 4.15
Niles,O. M4 ..... 4.65
Torrance, Calif. C11 .... 5.15

SHEETS, Cold-Rolled Steel (Commercial Quality)
Butler,Pa. A10 ..... 4.10
Cleveland J5, R2 ..... 4.10
Ecorse,Mich. G5 ..... 4.30
Fairfield,Ala. T2 ..... 4.10
Follansbee,W.Va. F4 .. 4.10
Fontana,Calif. K1 ..... 5.00
Gary,Ind. C3 ..... 4.10
GraniteCity,Ill. G4 .... 4.30
Ind.Harbor,Ind. I-2, Y- 4.10
Irvin,Pa. C3 ..... 4.10
Lackawanna,N.Y. B2 .. 4.10
Middletown,O. A10 ..... 4.10
Pittsburg,Calif. C11 .... 5.05
Pittsburgh J5 ..... 4.10
SparrowsPoint,Md. B2 .. 4.10
Steubenvill,O. W10 .... 4.10
Warren,O. R2 ..... 4.10
Weirton,W.Va. W6 .... 4.10
Youngstown Y1 ..... 4.10

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ..... 6.20
Ecorse,Mich. G5 ..... 6.40
Fontana,Calif. K1 ..... 7.10
Gary,Ind. C3 ..... 6.20
Ind.Harbor,Ind. I-2, Y1 6.20
Irvin,Pa. C3 ..... 6.20
Lackawanna,N.Y. B2 .... 6.20
Pittsburgh J5 ..... 6.20
SparrowsPoint,Md. B2 .. 6.20
Warren,O. R2 ..... 6.20
Weirton,W.Va. W6 .... 6.20
Youngstown Y1 ..... 6.20

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy

Cleveland J5, R2	5.05
Conshohocken,Pa. A3	*5.05*
Ecorse,Mich. G5	*5.25*
Fairfield,Ala. T2	5.05
Fontana,Calif. K1	*6.74*
Gary,Ind. C3	5.05
Ind.Harbor,Ind. I-2	5.05
Ind.Harbor,Ind. Y1	5.05
Irvin,Pa. C3	5.05
Lackawanna,N.Y. B2	5.05
Pittsburgh J5	5.05
Sharon,Pa. S3	5.05
So.Chicago,Ill. C3	5.05
SparrowsPoint,Md. B2	5.05
Warren,O. R2	5.05
Weirton,W.Va. W6	5.05
Youngstown C3 Y1	5.05

SHEETS, Gal'zd No. 10 Steel

AlabamaCity, Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	*5.15*
Dover,O. R1	5.65
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind. C16	4.50
MartinsFerry,O W10	4.40
Niles,O. N12	4.40
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. C3	6.75
SparrowsPoint,Md. B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	4.95

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.25
Niles,O. R2 (28)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Culvert, No. 16

	Cu Alloy	Cu Fe
Ashland A10	*5.20*	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T-2	5.20	5.45
Gary C3	5.20	5.45
GraniteCity G4	5.40	5.70
IndianaHarbor I-2	5.20	5.45
Irvin C3	5.20	5.45
Kokomo C16	5.40	...
MartinsFy,O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt, B2	5.20	...
Torrance,Cal. C11	5.95	...

SHEETS, Culvert, No. 16 Corrugated Ingot Iron

Ashland,Ky. A10	*5.45*

SHEETS, Well Casing

Torrance,Calif. C11	4.85
Youngstown C3	3.85

SHEETS, Drum Body

Pittsburg,Calif. C11	3.95
Torrance,Calif. C11	3.95

SHEETS, ALUMINIZED

Butler,Pa. A10	7.75

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBotm, W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Weirton,W.Va. W6	4.80

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.60
Gary,Ind. C3	6.50
Ind.Harbor I-2	6.65
Irvin,Pa. C3	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$1.20

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Yorkville,O. W10	8.10

SHEETS, Coated Ternes, 12 lb

Yorkville,O. W10	8.95

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	*3.60*
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R-2	4.70
Middletown,O. A10	*4.60*
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enam'lg. Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Niles,O. M4	4.90
Youngstown Y1	4.40

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	*5.80*
Ind.Harbor,Ind. Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.85
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Yorkville,O. W10	5.60

TIN PLATE, American Coke (base box)

	1.25 lb	1.50 lb
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2	7.40	7.60
Gary C3	7.30	7.50
Gran.City,Ill. G4	*7.50*	*7.70*
Ind.Harb. Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10	7.30	7.50

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	4.75

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	*4.75*

STRIP, Hot-Rolled Carbon

Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	*3.25*
Conshohocken,Pa. A3	3.35
Detroit M1	*3.55*
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.25
N.Tonawanda,N.Y. B11	3.30
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	3.90
Seattle B3, N14	4.25
Sharon,Pa. S3	3.25
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.25
Youngstown C3 Y1	3.25

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15	5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Harrison,N.J. C18	9.80
NewBritn,Conn.(10) S15	9.50
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.80

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.25-0.40C	0.40-0.60C	0.60-0.80C	0.80-1.05C	1.05-1.35C
Bridgeprt,Conn.(10) S15	4.00	5.50	6.10	8.05	10.35
Bristol,Conn. W1	...	...	6.40	8.35	...
Carnegie,Pa. S18	...	5.50	6.10	8.05	10.35
Chicago T6	4.25	5.65	6.25	8.20	10.50
Cleveland A7	4.00	5.50	6.10	8.05	10.35
Dover,O. G6	4.00	5.50	6.10	7.85	10.15
Harrison,N.J. C18	...	...	6.40	8.35	10.65
Mattapan,Mass. T6	4.50	5.80	6.40	8.35	10.65
NewBritn.,Conn(10) S15	4.00	5.50	6.10	8.05	10.35
NewCastle,Pa. B4	4.00	5.50	6.10	8.05	...
NewCastle,Pa. E5	4.00	5.50	6.10	8.05	10.35
NewYork W3	...	5.80	6.40	8.35	10.65
Pawtucket,R.I. N8:					
Cleve.orPitts.Base	4.55	5.50	6.10	8.05	10.35
Worcester,Mass.Base	4.50	5.80	6.40	8.35	10.65
Sharon,Pa. S3	4.00	5.50	6.10	8.05	10.35
Trenton,N.J. R5	...	6.30	6.90	8.85	11.15
Union,N.J. H6	4.40	6.35	6.35	8.30	10.50
Wallingford,Conn. W2	4.50	5.80	6.40	8.05	10.35
Weirton,W.Va. W6	4.00	5.50	6.10	8.05	10.35
Worcester,Mass. A7	4.30	5.80	6.40	8.35	10.65
Worcester,Mass. T6	4.50	5.80	6.40	8.35	10.65
Youngstown C8	4.50	5.50	6.10	8.05	10.35
Sharon,Pa. S3	9.50				
Worcester,Mass. A7	9.80				
Youngstown C8	9.50				

STRIP, Cold-Rolled Carbon

Berea,O. C7	6.10
Bridgeprt,Conn.(10) S15	*4.15*
Butler,Pa. A10	*4.15*
Chicago T6	4.30
Cleveland A7, J5	4.15
Dearborn,Mich. D3	4.40
Detroit, D2	4.40
Detroit M1	*4.35*
Dover,O. G6	4.15
Ecorse,Mich. G5	*4.35*
Follansbee,W.Va. F4	4.15
Fontana,Calif. K1	*5.40*
Ind.Harbor,Ind. I-2	4.30
Lackawanna,N.Y. B2	4.15
LosAngeles C1	5.50
Mattapan,Mass.(21) T6	4.50
Middletown,O. A10	*4.15*
NewBritain(10) S15	4.00
NewCastle,Pa. B4, E5	*4.15*
NewHaven,Conn. A7, D2	4.65
NewKensington,Pa. A6	4.00
NewYork W3	5.00
Pawtucket,R.I.(11) N8	4.55
Pawtucket,R.I.(11) N8	*4.70*
Pawtucket,R.I.(21) N8	*4.65*
Riverdale,Ill. A1	4.30
Sharon,Pa. S3	4.15
SparrowsPoint,Md. B2	4.15
Trenton,N.J.(13) R5	*4.65*
Wallingford,Conn. W2	*4.65*
Warren,O.(25) T5	*4.15*
Warren,O. R2	4.15
Weirton,W.Va. W6	4.15
Youngstown Y1	4.15
Youngstown C8	4.00

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.20
Dover,O. G6	*6.20*
Ecorse,Mich. G5	*6.40*
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.05
Sharon,Pa. S3	6.30
SparrowsPoint,Md. B2	6.05
Warren,O. R2	6.20
Weirton,W.Va. W6	6.20
Youngstown Y1	6.05

STRIP, Electro Galvanized

Weirton,W.Va. W6	4.15
Youngstown C8	4.00

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	*6.55*	*6.80*	*7.05*
Ind.Harbor,Ind. Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.55	6.80	7.10
Weirton,W.Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON (24 Ga. Base)

	Field	Arm.	Elec.	Motor	Dyn.
BeechBottom,W.Va. W10 (27)					
Cut Lengths	...	6.45	6.95	7.95	8.75
Coils	...	6.95	7.45	8.45	9.25
Brackenridge,Pa. A4 (27)					
Cut Lengths	...	...	6.95	7.95	8.75
Coils	...	...	7.45	8.45	9.25
Follansbee,W.Va. F4	...	...	7.70	8.45	9.25
GraniteCity,Ill. G4	...	...	7.15	8.15	...
Ind.Harbor,Ind. I-2	5.90	6.20	6.70	...	...
Mansfield,O. E6	5.15	5.45	5.95	6.70	...
Niles,O. M4	5.65	5.95	6.45	...	...
Niles,O. N12	...	5.45	5.95	...	...
Toronto,O. F4	...	...	7.70	8.45	9.25
Vandergrift,Pa. C3 (27)					
Cut Lengths	...	6.45	6.95	7.95	8.75
Coils	...	6.95	7.45	8.45	9.25
Warren,O. R2	...	6.45	6.95	7.95	...
Zanesville,O. A10:					
Cut Lengths	...	...	*6.95*	*7.95*	*8.75*
Coils	...	...	*7.45*	*8.45*	*9.25*

COILS AND CUT LENGTHS, Cold-Rolled, Silicon

	Field	Arm.	Elec.	Motor	Dyn.
Warren,O. R2	6.65	6.95	7.45	8.45	9.25

SHEETS, Silicon Transformer Grade

	72	65	58	52
BeechBottom,W.Va. W10 (27)				
Cut lengths	9.30	9.85	10.55	11.35
Coils	9.80	10.35	11.05	11.85
Brackenridge,Pa. A4 (27)				
Cut Lengths	9.30	9.85	10.55	....
Coils	9.80	10.35	11.05	....
Follansbee,W.Va. F4	9.80	10.35	11.05	11.85
Toronto,O. F4	9.80	10.35	11.05	11.85
Vandergrift,Pa. C3 (27):				
Cut Lengths	9.30	9.85	10.55	11.35
Coils	9.80	10.35	11.05	11.85
Zanesville,O. A10:				
Cut Lengths	*9.30*	*9.85*	*10.55*	*11.35*
Coils	*9.80*	*10.35*	*11.05*	*11.85*

COLD-REDUCED COILS and Cut Lengths, Silicon

	72	T-100	T-90	T-80
Vandergrift,Pa. C3 (27)	...	12.35	13.60	14.85
Warren,O. R2	9.80	....	....	....

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B14 A. M. Byers Co.

C1 Calif. Cold-Rolled Steel
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Clev. Cld.Roll.MillsCo.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Col. Steel & Shafting Co.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Co.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F6 Fretz-Moon Tube Co.

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H4 Heppenstall Co.
H6 Hind Steel Co. Inc.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	6.64
Gary, Ind. C3	4.95
Ind.Harb.,Ind. I-2, Y1	4.95
Lackawanna,N.Y. B2	4.95
Sharon,Pa. S3	4.95
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

TIGHT COOPERAGE HOOP

Atlanta A11	3.60
Riverdale,Ill. A1	3.60
Sharon,Pa. S3	3.60
Youngstown C3	3.60

WIRE, Cold-Rolled Flat

Chicago T6	5.35
Cleveland A7	5.35
Dover,O. G6	5.15
Fostoria,O. S1	5.50
Kokomo,Ind. C16	5.00
Massillon,O. R8	*5.35*
Monessen,Pa. P7	5.00
Pawtucket,R.I.(11) N8	*5.70*
Pawtucket,R.I.(12) N8	*5.65*
Trenton,N.J. R5	*5.65*
Worcester,Mass. A7	5.65
Worcester,Mass. T6	5.30

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(1) K4	7.70
Buffalo W12	7.70
Chicago W13	7.70
Cleveland A7	8.05
Fostoria,O. S1	8.20
Johnstown,Pa. B2	7.70
Kokomo,Ind. C16	7.70
Palmer,Mass. W12	8.00
Portsmouth,O. P12	7.70
Trenton,N.J. R5	*8.75*
Waukegan,Ill. A7	8.05
Worcester,Mass. T6	8.00
Worcester,Mass. A7	8.35

WIRE (16 gage)	An'ld. Galv. Stone	An'ld. Galv. Stone
Aliquippa J5	9.05	10.55
Bartnvill(1) K4	9.05	10.55
Cleveland A7	9.40	10.90
Fostoria,O. S1	9.65	11.15
Johnstown B2	*9.80*	*11.30*
Kokomo C16	9.60	10.90
Minnequa C10	9.40	10.90
Palmer,Mass. W12	9.35	10.85
Pitts.,Cal. C11	9.75	11.25
Prtsmth.(18) P12	9.05	10.55
SparrowsPt. B2	*9.90*	*11.40*
Waukegan A7	9.40	10.90

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity, Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Atlanta A11	4.60
Alton,Ill.(1) L1	4.15
Bartonville,Ill.(1) K4	4.50
Buffalo W12	4.15
Chicago W13	4.15
Cleveland C20	4.15
Cleveland A7	4.50
Crawfrdsvil,Ind. M8	4.30
Donora,Pa. A7	4.50
Duluth A7	4.50
Fairfield,Ala. T2	4.50
Fostoria,O.(24) S1	4.65
Houston S5	4.55
Johnstown,Pa. B2	4.50
Joliet,Ill. A7	4.50
KansasCity,Mo. S5	4.75
Kokomo,Ind. C16	4.60
LosAngeles B3	5.10
Minnequa,Colo. C10	4.50
Monessen,Pa. P7	4.50
Newark,6-8ga. I-1	4.75
No.Tonawanda B11	4.18
Palmer,Mass. W12	4.45
Pittsburg,Calif. C11	5.45
Portsmouth,O. P12	4.15
Rankin,Pa. A7	4.50
So.Chicago,Ill. R2	4.50
So.SanFrancisco C10	5.10
SparrowsPoint,Md. B2	4.60
Sterling,Ill.(1) N15	4.50
Struthers,O. Y1	4.50
Torrance,Calif. C11	5.45
Waukegan,Ill. A7	4.50
Worcester,Mass. T6	4.45
Worcester,Mass. A7	4.80

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	5.90
Alton,Ill(1) L1	5.55
Bartonville,Ill.(1) K4	5.90
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Fostoria,O. S1	6.05
Johnstown,Pa. B2	5.90
LosAngeles B3	6.50
Milbury,Mass.(12) N6	*6.20*
Monessen,Pa. P7	5.90
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.55
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Struthers,O. Y1	5.90
Trenton,N.J. A7	5.85
Trenton,N.J. R5	6.20
Waukegan,Ill. A7	5.55
Worcester A7,J4,T6,W12	5.85

ROPE WIRE	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	8.05	8.05	8.30
Buffalo W12	7.50	7.80	8.20
Cleveland A7	7.50	7.80	8.20
Donora,Pa. A7	7.50	7.80	8.20
Fostoria,O. S1	8.00	8.30	8.70
Johnstown,Pa. B2	7.50	7.80	8.20
Monessen,Pa. P7	7.50	7.80	8.20
NewHaven,Conn. A7	7.80	8.10	8.50
Palmer,Mass. W12	7.80	8.10	8.50
Portsmouth,O. P12	7.50	7.80	8.20
SparrowsPoint,Md. B2	7.60	7.90	8.30
Struthers,O. Y1	7.50	7.80	8.20
Trenton,N.J. A7	7.80	8.10	8.50
Trenton,N.J. R5	*8.05*	*8.05*	*8.30*
Waukegan,Ill. A7	7.50	7.80	8.20
Williamsport,Pa. B2	7.60	7.90	8.30
Worcester, Mass. J4	7.70	8.10	8.50

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
Ala.City, R2	*5.35*	*5.60*
Aliquippa J5	5.35	5.60
Atlanta A11	5.25	5.70
Bartnville(19) K4	5.35	5.60
Buffalo W12	4.80	...
Cleveland A7	5.15	5.60
Donora A7	5.15	5.60
Duluth A7	5.15	5.60
Fairfield T2	5.15	5.60
Crawfrdvil. M8	4.95	5.40
Houston,Tex. S5	5.20	5.65
Johnstown B2	5.35	5.60
Joliet,Ill. A7	5.15	5.60
KansasCity,Mo. S5	5.40	5.85
Kokomo C16	5.25	5.70
LosAngeles B3	5.75	...
Minnequa C10	5.15	5.60
Monessen P7	5.35	5.60
Palmer,Mass. W12	5.10	...
Pitts.,Cal. C11	6.10	6.55
Portsmth.(18) P12	4.80	5.25
Rankin A7	5.15	5.60
So.Chicago R2	*5.35*	*5.60*
So.S.Fran. C10	5.75	6.20
SparrowsPt. B2	5.45	5.70
Sterling,Ill.(1)N15	5.35	5.60
Struthers,O. Y1	5.35	5.60
Torrance,Cal. C11	6.10	...
Worcester A7	5.45	5.90

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.55
Alton,Ill.(1) L1	5.20
Buffalo W12	5.20
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Johnstown,Pa. B2	5.55
Los Angeles B3	6.15
Monessen P7	5.55
NewHaven,Conn. A7	5.85
Palmer,Mass. W12	5.50
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.20
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Torrance,Calif. C11	6.50
Trenton,N.J. A7, R5	*5.85*
Waukegan,Ill. A7	5.55
Worcester,Mass. A7	5.85

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	126
Atlanta A11	128
Bartonville,Ill.(19) K4	126
Crawfordsville M8	126
Donora,Pa. A7	1.26
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Houston,Tex. S5	131
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
KansasCity,Mo. S5	135
Kokomo,Ind. C16	128
Minnequa,Colo. C10	130
Monessen,Pa. P7	126
Pittsburg,Calif. C11	146
Portsmouth,O.(18) P12	123
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
So.SanFran.,Calif. C10	143
SparrowsPoint,Md. B2	128
Sterling,Ill.(1) N15	126

FENCE POSTS	Col.
Duluth A7	112
Huntington,W.Va. W7	112
Johnstown,Pa. B2	112
Joliet,Ill. A7	112
Minnequa,Colo. C10	120
Moline,Ill. R2	116
Williamspt.Pa. S19	n.t.$120

WOVEN FENCE, 9-15½ gage

	Col.
Ala.City,Ala.,17-18ga. R2	*198*
AlabamaCity,Ala. R2	116
Aliquip.,Pa.9-14½ga. J5	116
Atlanta A11	118
Bartonville,Ill.(19) K4	116
Crawfordsvil.Ind. M8	112
Donora,Pa. A7	116
Duluth A7	116
Houston,Tex. S5	117
Fairfield,Ala. T2	116
Johnstown,Pa. B2	116
Johnstn,17ga.,6" B2	190
Johnstn.17ga.,4" B2	193
Joliet,Ill. A7	116
KansasCity,Mo. S5	121
Kokomo,Ind. C16	118
Minnequa,Colo. C10	116
Monessen,Pa. P7	116
Pittsburg,Calif. C11	139
Portsmouth,O.(18) P12	109
Rankin,Pa. A7	116
So.Chicago,Ill. R2	116
Sterling,Ill.(1) N15	116

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	113
Atlanta A11	114
Bartonville,Ill.(19) K4	113
Chicago W13	106
Crawfordsville M8	109
Donora,Pa. A7	113
Duluth A7	113
Fairfield,Ala. T2	113
Joliet,Ill. A7	113
Kokomo,Ind. C16	115
Minnequa,Colo. C10	113
Pittsburg,Calif. C11	137
Portmouth,O.(18) P12	106
So.Chicago,Ill. R2	113
So.SanFran.,Calif. C10	130
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	113

NAILS & STAPLES, Stock To Dealers & Mfrs. (7)

AlabamaCity,Ala. R2	106
Aliquippa,Pa. J5	106
Atlanta A11	108
Bartonville,Ill.(19) K4	106
Chicago,Ill. W13	103
Cleveland A9	112
Crawfordsville M8	106
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Houston, Tex. S5	111
Johnstown,Pa. B2	106
Joliet,Ill. A7	106
KansasCity,Mo. S5	115
Kokomo,Ind. C16	108
Minnequa,Colo. C10	110
Monessen,Pa. P7	106
Pittsburg,Calif. C11	125
Portsmouth,O. P12	103
Rankin,Pa. A7	106
So.Chicago,Ill. R2	106
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	106
Torrance,Calif. C11	126
Worcester,Mass. A7	112

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2.	TeeRails 60 lb Under
Bessemer,Pa. C3	3.40	3.30	3.25	3.75
Ensley,Ala. T2	3.40	3.30	...	3.75
Fairfield,Ala. T2	...	...	...	3.75
Gary,Ind. C3	3.40	3.30	3.35	...
Huntington,W.Va. W7			*(9)*	*3.75*
Ind.Harbor,Ind. I-2	3.40	3.30	3.35	...
Johnstown,Pa. B2	...	...	(16)	3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa,Colo. C10	*3.40*	*3.30*	...	*4.25*
Steelton,Pa. B2	3.40	3.30	...	...

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.35
Bartonville,Ill.(19) K4	5.35
Donora,Pa. A7	5.35
Duluth A7	5.35
Johnstown,Pa. B2	5.35
Joliet,Ill. A7	5.35
Kokomo,Ind. C16	5.45
Minnequa,Colo. C10	5.55
Pittsburg,Calif. C11	6.30
Portsmouth,O. P12	5.20
Rankin,Pa. A7	5.35
So.Chicago,Ill. R2	5.35
SparrowsPoint,Md. B2	5.45
Worcester,Mass. A7	5.65

NAILS, Cut (100 lb keg)

Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

AXLES

Fairfield,Ala. T2	5.25
Gary,Ind. C3	5.25
Ind.Harbor,Ind. N15	*5.25*
Johnstown,Pa. B2	5.20
McKeesRocks,Pa. C3	5.25

TIE PLATES

Fairfield,Ala. T2	4.20
Gary,Ind. C3	4.20
Ind.Harbor,Ind. I-2	4.20
Lackawanna,N.Y. B2	4.20
Minnequa,Colo. C10	4.05
Pittsburg,Calif. C11	4.35
Pittsburgh R2	4.20
Seattle B3	4.65
Steelton,Pa. B2	4.20
Torrance,Calif. C11	4.35
Weirton,W.Va. W6	4.05

JOINT BARS

Bessemer,Pa. C3	4.40
Fairfield,Ala. T2	4.40
Ind.Harbor,Ind. I-2	4.40
Joliet,Ill. C3	4.40
Lackawanna,N.Y. B2	4.40
Minnequa,Colo. C10	4.25
Steelton,Pa. B2	4.40

TRACK BOLTS (20) Treated

Fairfield,Ala. T2	8.50
Lebanon,Pa. B2	8.50
Minnequa,Colo. C10	8.25
Pittsburgh,Pa. O3, P14	8.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	5.35
Ind.Harbor,Ind. Y1	5.35
Ind.Harbor,Ind. I-2	5.35
Kansas City, Mo. S5	5.60
Lebanon,Pa. B2	*5.60*
Minnequa,Colo. C10	5.35
Pittsburgh J5	5.35
So.Chicago,Ill. R2	5.35
Struthers,O. Y1	5.35
Youngstown R2	5.35

LIGHT RAILS, Rail Steel

Huntington,W.Va. W7	3.55
Williamsport,Pa. S19	3.55

Key to Producing Companies

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M10 Missouri-Illinois Furnace
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 New EngHighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R7 Rotary Electric Steel Co.
R8 Reliance Div.,Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S7 Simmonds Co.
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
T2 Tenn. Coal, Iron & R.R.
T3 Terin. Prod.& Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U4 Universal Cyclops Steel
V2 Vanadium Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Corp.
W7 W. Va. Steel & Mfg. Co.
W8 Wstrn.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron.
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester Co.
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstwn Sheet & Tube

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	1sw,4Cr,3V	126.00
Extra Carbon	24.50	18W,4Cr,2V,9Co	185.50
Spec. Carbon	29.50	18W,4Cr,2V,6Co	on application
Oil Hardening	32.00	18.25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk.	32.00	20.25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr,1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V,6Mo	97.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M9, M14, R2, S8, T7, U4, V2, V3.

(1) Chicago Base. (2) Angles. (3) Merchant. (4) Reinforcing. (5) Philadelphia del. (6) Chicago or Birm. Base. (7) To jobbers, 3 cols. lower. (8) 16 gage and heavier. (9) Rail steel. (10) Pittsburgh Base. (11) Cleveland & Pittsburgh Base (12) Worcester, Mass. Base. (13) 3" & wider; over ½" to under 3" 5.15c. (14) Also wide flange beams. (15) ½" and thinner. (16) 40 lb and under. (17) Flats only. (18) To dealers. (19) Chicago & Pittsburgh Base. (20) Deduct 0.25c for untreated. (21) New Haven, Conn. Base. (22) Del. San Fran. Bay area. (23) Angles 1"x1" to 1¼"x1¼" only. (24) Deduct 0.35c for finer than 15 Ga. (25) Up to 0.035 C; 4.40c, 0.035 C and over. (26) Reinforcing, mill shipments; to consumers, 4.83c; fabricated to fabricators, 4.58c. (27) 22 Gage; hot or cold-reduced. (28) Bonderized.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	36.5	34.5	...	8.5	9	...
¼	6.0	0.42	33.5	31.5	...	9.5	11	...
⅜	6.0	0.57	29	27	...	5.5	8	...
½	8.5	0.85	40.5	38.5	39.5	24.0	22.0	23.0
¾	11.5	1.13	43.5	41.5	42.5	28.0	26.0	27.0
1	17.0	1.68	46.0	44.0	45.0	31.0	29.0	30.0
1¼	23.0	2.28	46.5	44.5	45.5	31.5	29.5	30.5
1½	27.5	2.73	47.0	45.0	46.0	32.0	30	31.0
2	37.0	3.68	47.5	45.5	46.5	32.5	30.5	31.5
2½	58.5	5.82	48.0	46.0	47.0	33.0	31.0	32.0
3	76.5	7.62	48.0	46.0	47.0	33.0	31.0	32.0

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower on ⅜", W10. Wheatland, Pa., 2 pts lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N3; Youngstown, plus 42% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y1.

Column D: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa., ⅛" through ⅜", F6; Benwood, W. Va., except 3½ points lower on ⅛", 2½ pts on ¼", 3 pts on ⅜" W10. Wheatland, Pa., except 2 pts lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain N3; Youngstown, plus 26.5% on 3½" and 4", R2; Youngstown, Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 15.5% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	36.0	20.5	36.0	20.5
2½	58.5	5.82	39.0	23.5	39.0	23.5
3	76.5	7.62	39.0	23.5	39.0	23.5
3½	92.0	9.20	41.0	25.5	41.0	25.5
4	$1.09	10.89	41.0	25.5	41.0	25.5
5	1.48	14.81	41.0	25.5	41.0	25.5
6	1.92	19.18	41.0	25.5	41.0	25.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, O. N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16.17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2¼	13	22.96	27.03	22.27	26.22
2¼	12	25.29	29.76	24.53	28.87
2½	12	27.71	32.58	26.88	31.60
2¾	12	29.36	34.53	28.48	33.49
3	12	30.82	36.27	29.90	35.18
3¼	11	35.87	42.22	34.79	40.95
3½	11	38.52	45.35	37.36	43.99
4	10	47.82	56.25	46.39	54.56
4½	9	63.37	74.59	61.47	72.35
5	9	73.37	86.32	71.17	83.73
6	7	112.62	132.51	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pacific Tube Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

CLAD STEELS

(Cents per pound)

Cladding	Plates Carbon Base		Strip Cold-Rolled Carbon Base		Sheets Carbon Base		Copper Base
					10%	20%	Both Sides
Stainless	10%	20%	10%	Both Sides			
302	....	....	....	....	19.75	21.50–	75.00
304	22.50	26.50	....	....	20.75	22.50–	77.00
305	....	....	....	....	....	....	79.00
309	27.00	31.00	....	....	....	....	....
310	32.50	36.50	....	....	....	....	105.00
316	27.00	31.00	....	....	26.00	28.00–	....
317	30.50	34.50	....	....	....	....	....
318	29.50	33.50	....	....	....	....	....
321	23.50	27.50	....	....	23.00	25.00	90.00
347	25.00	29.00	....	....	24.00	26.00–	94.00
405	18.75	24.75	....	....	....	....	....
410	18.25	24.25	....	....	....	....	....
430	18.25	24.25	....	....	....	....	....
Nickel	27.50	34.50	31.50	41.00	....	....	88.00
Inconel	36.00	46.00	....	....	....	....	115.00
Monel	29.00	37.00	26.50	33.50	....	....	83.00
Copper*	....	....	19.75†	23.75†	....	....	....

* Deoxidized. † Deduct 4.25c for hot-rolled. Production for carbon base products are: Stainless plates and sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16 and Coatesville, Pa. L7; nickel, inconel and monel-clad plates, Coatesville L7; nickel, monel and copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie A13.

BOLTS, NUTS

(To consumers. New discount schedules now being prepared)

F.o.b. midwestern plants. Additional discounts on carriage, machine bolts, 5 for cl; 15 for full containers, except tire and plow bolts.

CARRIAGE, MACHINE BOLTS

(Per cent off list)

½-in., smaller; up to 6 in. long 35
⅝ & ⅞ x 6 in., shorter. 37
⅛-in. & larger x 6 in., shorter 34
All diameters longer than 6-in. 30
Tire bolts 25
Plow bolts 47
Lag bolts, 6 in., shorter 37
Lag bolts, longer than 6 in. 35

NUTS

	A.S. Light	Reg. & Heavy
Semifinished hexagon		
⅞-in., smaller	41 off	.....
½-in., smaller	....	38 off
½-in.-1-in.	39 off	.....
⅝-in.-1-in.	....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in., larger	34 off	28 off

Additional discount of 15 for full containers.

STOVE BOLTS

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

SQUARE HEAD SET SCREWS

Upset 1-in. & smaller 51 off
⅜, ⅞, & 1 x 6-in. & shorter ..... 35 off
Headless, ¼-in., larger 31 off

HEXAGON CAP SCREWS

(Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright) ..... 46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter ..... 40 off

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.25c
⅞-in., under .....43 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....Net to $1 off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Inches Length	Cents per lb.
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4,5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00

CARBON

40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	34,90	7.50
14	60,72	8.00
10,12	60	8.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Imported, net ton, duty paid, metallurgical grade, $39-$40.

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	37.50	30.50	28.50
302	37.50	33.00	28.50
303	39.50	36.50	31.00
304	39.50	35.00	30.00
309	52.00	52.00	41.50
316	53.00	55.00	46.00
321	45.50	44.50	34.00
347	50.00	48.50	38.50
410	33.00	27.00	23.00
416	33.50	33.50	23.50
420	40.50	43.50	28.50
430	35.50	27.50	23.50
501	24.00	22.50	11.50
502	25.00	23.50	12.50

Baltimore, Types 301 through 347 sheets, except 309 E2.

Baltimore, bars, wire and structurals A10.

Brackenridge, Pa., sheets A4

Bridgeville, Pa., bars, wire, sheets & strip, except Type 309 strip quoted 51.00c U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.

Carnegie, Pa., strip except Type 416; Type 309 strip quoted 51.00c S18.

Cleveland, strip, except Type 309 quoted 51.00c, and except Type 416 A7.

Detroit, strip, except Type 309 M1.

Dunkirk, N. Y., bars, wire A4.

Duquesne, Pa., bars C3.

Gary, Ind., sheets except Type 416 C3.

Harrison, N. J., strip C18.

Massillon, all products, except Type 309 bars, wire & cept Type 300 bars, wire & structurals quoted 42.00c, Type 501, 10.50c, Type 502 11.50c R2.

McKeesport, Pa., bars; sheets except Type 416, C3.

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.

Middletown, O., sheets and strip, except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & 3trip C18.

Munhall, Pa., bars C3.

Pittsburgh, sheets C18.

Reading, Pa., bars & strip except Type 309 bars quoted 42.00c C4.

So. Chicago, Ind., bars & structurals C3.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip, except 309, W2 quotes ¼-cent higher.

Washington, Pa., bars, sheets & strip except Type 309 strip quoted 51.00c J3.

Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 58.00c strip 60.00c W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, except Type 309 quoted 51.00c A4.

Youngstown, strip C8.

COAL, CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 22.00
Toluol, one deg...19.00-24.75
Industrial xylol ..20.50-26.50

Per ton bulk, ovens
Sulphate of ammonia..$45.00

Per pound, ovens
Phenol, 40 (carlots, returnable drums) 13.25
Do., less than carlots..14.00
Do., tank cars 12.50

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh)

	Cents
Sponge Iron:	
98+% Fe, carlots	15.00
Swedish, c.i.f. New York, in bags	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	39.50
Unannealed, 99+% Fe	33.50
Unannealed, 99+% Fe (minus 325 mesh)	48.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns	65.00-130.00
Aluminum:	
Carlots, freight allowed	27.00
Atomized, 500-lb drums, freight allowed	30.00
Brass, 10-ton lots	23.25-26.25
Copper:	
Electrolytic	27.75
Reduced	27.00
Lead	18.50
Manganese:	
Minus 100-mesh	52.00-55.00
Minus 35 mesh	48.00
Minus 200 mesh	56.00
Nickel, unannealed	61.00-66.00
Silicon	34.00-40.00
Solder (plus cost of metal)	8.50
Stainless Steel, 302	75.00
Tin	90.00-90.75
Zinc, 10-ton lots	15.50-18.25
	Dollars
Tungsten:	
99%, minus 80 to 200 mesh, freight allowed, 1000 lb and over	2.90
500 to 1000 lb	2.95
less than 500 lb	3.05
98.8%, minus 65 mesh, freight allowed, 1000 lb and over	2.90
less than 1000 lb	3.05
Molybdenum:	
99%, minus 80 to 200 mesh, over 500 lb	2.25
200 to 500 lb	2.50
less than 200 lb	2.75
82-88%, freight allowed, 2000 lb and over	2.40
less than 2000 lb	2.45
Chromium, electrolytic, 99% Cr min.	3.50

METALLURGICAL COKE

Price per Net Ton

BEEHIVE OVENS

Connellsvll, fur. $13.00-13.50
Connellsvll, fdry..15.00-16.00
New River, foundry....18.00
Wise county, foundry..15.35
Wise county, furnace..14.60

OVEN FOUNDRY COKE

Kearny, N. J., ovens $22.00
Everett, Mass., ovens
New England, del.‡..22.70
Chicago, ovens 20.00
Chicago, del. .....‡21.45
Detroit, del. ..... ‡23.91
Terre Haute, ovens....20.20
Milwaukee, ovens 20.75
Indianapolis, ovens 19.85
Chicago, del. 23.32
Cincinnati, del. 22.77
Detroit, del. 23.75
Ironton, O., ovens 19.40
Cincinnati, del. 21.63
Painesville, O., ovens..20.90
Buffalo, del. 23.02
Cleveland, del. 22.62
Erie, del. 21.04
Birmingham, ovens 17.70
Philadelphia, ovens ..20.45
Swedeland, Pa., ovens 20.40
Portsmouth, O., ovens 19.50
Detroit, ovens 20.65
Detroit, del. .....‡21.70
Buffalo, del. 22.95
Flint, del. 23.00
Pontiac, del. 21.98
Saginaw, del. 23.30

Includes representative switching charge of: *, $1.05; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.03 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS				PLATES	
	H.R. 18 Ga., Heavier*	C.R. 15 Ga	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§	Standard Structural Shapes	Carbon	Floor
New York (city)	5.75	6.84	7.20	6.04	...	5.85	6.64	8.60	5.65	5.90	7.34
New York (c'try)	5.55	6.54	6.90	5.84	...	5.65	6.44	8.40	5.45	5.70	7.16
Boston (city) ..	5.93	6.93	7.44	5.98	...	5.80	6.78	9.07	5.75	6.08	7.28
Boston (c'try) .	5.73	6.73	7.24	5.78	...	5.60	6.58	8.87	5.55	5.88	7.08
Phila. (city)...	5.90	6.49	6.88	5.90	...	5.75	6.21	8.10	5.50	5.70	6.80
Phila. (c'try)..	5.61	6.24	6.63	5.65	...	5.50	5.96	7.85	5.25	5.45	6.55
Balt. (city) ...	5.46	6.36	6.81	5.52	...	5.57	6.05	...	5.51	5.71	7.16
Balt. (c'try) ..	5.31	6.21	6.66	5.37	...	5.42	5.91	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)..	5.00‡	5.90	7.57	5.39	6.42	5.10	5.60	10.13	5.15	5.50	7.06
Buffalo (w'hse)	4.85‡	5.75	7.42	5.24	6.27	4.95	5.40	9.60	5.00	5.35	6.91
Pitts. (w'hse)..	4.85-5.05	5.75-5.80*	6.70*	5.00-5.20	...	4.90-5.00	5.40-5.75	9.20-9.55††	4.90-5.05	5.05-5.15	6.40
Detroit (w'hse).	5.32	6.22[4]*	7.35	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.25	6.00	6.70	5.44	6.20	5.32	5.95	8.31	5.37	5.52	6.87
Cleve. (w'hse) .	5.05	5.80	6.55	5.24	6.00	5.12	5.75	8.16	5.17	5.32	6.67
Cincin. (w'hse).	5.47	5.99	6.44	5.64	...	5.54	6.25	8.55	5.59	5.74	6.90
Chicago (city)..	5.25	6.00*	6.90	5.30	...	5.20	5.85	9.70	5.25	5.40	6.60
Chicago (w'hse)	5.05	5.80*	6.70	5.10	...	5.00	5.65	9.50	5.05	5.20	6.40
Milwaukee(city)	5.39	6.14*	7.04	5.44	...	5.34	6.09	9.84	5.39	5.54	6.74
Milwau. (c'try).	5.19	5.94*	6.84	5.24	...	5.14	5.89	9.64	5.19	5.34	6.54
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
St. L. (w'hse).	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.00	5.90	6.55	5.00	...	5.05	6.59	...	5.05	5.25	7.74
Birm'ham(c'try)	4.85	5.75	6.40	4.85	...	4.90	...	...	4.90	5.10	...
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	5.60	7.15	7.60	6.10	7.75	5.75	7.40	...	5.60	5.65	7.90
L. A. (w'hse)..	5.45	7.00	7.45	5.95	7.60	5.60	7.25	...	5.45	5.50	7.75
San Francisco..	6.25[9]	8.60[2]	8.50[2]	6.75[9]	8.25[3]	6.15[9]	9.30[8]	...	6.00[9]	6.15[9]	8.10[9]
Seattle-Tacoma.	6.70[7]‡	8.15[3]	8.80	6.70[7]	...	6.20[7]	8.15[1]	10.10	6.00[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); § as rolled; †† as annealed. Base quantities: 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; [1]—1500 lb and over; [2]—150 to 499 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 999 lb; [8]—300 to 499 lb; [9]—400 to 3999 lb.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $107. Hard-fired, $141 at above points.

High-heat Duty: Salina, Pa. $91; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $86.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $80.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $72.

LADLE BRICK

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa., Chester, New Cumberland, W. Va., Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $96; Beach Creek, Pa., $86.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $86; Hays, Pa., $91; Joliet or Rockdale, Ill., E. Chicago, Ind., $95; Lehi, Utah, Los Angeles, $101.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $84.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $85.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains; Bulk, $30.50-$31; single paper bags, $35-$35.50.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

EASTERN LOCAL ORE

Cents per unit, del. E. Pa.

Foundry and basic 56.62% concentrates, contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
Brazil iron ore, 68-69%	18.50

TUNGSTEN ORE

Wolframite, scheelite, net ton unit, duty paid	$20-$22

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid. 81.8c-83.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$35.00
48% 3:1	37.50
48% no ratio	28.50-29.00
South African Transvaal	
44% no ratio	$19.00-20.00
45% no ratio	19.50-21.00
48% no ratio	27.00-28.00
50% no ratio	28.50-29.00
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	28.00-29.00
48% 3:1 lump	37.50
Domestic—rail nearest seller	
48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolitic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

Chromium Alloys

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(*Please turn to page* 108)

Zinc Price Tone Strengthens

Most sellers raise prices to basis of 10.00c, East St. Louis, for prime western; limited tonnage available at former 9.75-cent level. Tin declines to 77.50-cent level

New York—Trading in nonferrous metals opens the new year on a generally firm price basis. Zinc demand is expected soon to absorb tonnages still available from a large custom smelter at the 9.75-cent level and continues fair for metal offered at 10.00c, the level to which a large midwestern producer advanced on Dec. 28. Lead buying is well diversified and sufficient to balance daily intake of ore and concentrates. Inquiry for February delivery of copper indicates that there has been no letup in demand for that metal from the high levels attained in the final quarter of last year. Only in tin is the undertone soft, Grade A metal being available at around 77.50c for prompt delivery and as low as 73.75c for April arrival. The market is now at a new low since mid-March, 1947, when the price was fixed at 70.00c, New York.

Lead and zinc producers in the Tri-State district urge early congressional action on a relief measure, probably the O'Mahoney bill, to make possible a revival of activity in their mines. Operators see need for sharp curtailment of imports, either through import limitations or higher tariffs, or the granting of direct subsidy payments to the domestic industry.

Elmer Isern, president, Eagle-Picher Mining & Smelting Co., says the Tri-State district needs a minimum price of 15 cents a pound for lead and 12 cents for zinc to keep going.

Zinc—Consolidated Mining & Smelting Co. of Canada Ltd. advanced its selling prices, effective Dec. 29, ¼-cent a pound on all grades of zinc. The new Canadian prices, in Canadian currency, f.o.b. Toronto or Montreal, are: Prime western, 11.00c; High Grade, 99.75 per cent, 11.75c; Special Grade, 12.00c.

The advance in the domestic market had been preceded by a steady improvement in demand, especially from galvanizers. Bulk of buying interest at present is for delivery late this quarter, nearby needs being fairly well covered. A majority of the orders being booked are on an average price basis.

Lead—Prices are holding steady on the basis of 11.80c, St. Louis, for the common grade, as demand holds at a satisfactory level. The battery industry is taking moderate tonnages, while cable makers also are among the more prominent buyers.

Copper—An increasingly tight situation in copper during the first quarter is forecast by many of the leading market authorities. Only a few suppliers have opened books for February and, on the basis of their experience, tonnages sought for that delivery will be as heavy as any in the last three or four months. Orders booked for delivery in December, including a carryover from November, were in excess of 113,300 tons. Production plus imports will be insufficient to cover needs fully and these supplies cannot be augmented to any important degree by a further drain on refinery stocks, trade authorities say.

T. E. Veltfort, manager, Copper & Brass Research Association, believes demand for copper during the first half of this year should continue at the present annual consumption rate of 1,300,000 tons. If the projected activity in the building industry materializes, he said, this industry probably will consume more than 250 million pounds in 1950. This industry rates second to the electrical industry in the consumption of copper and copper-base alloy products. The automotive industry also is likely to consume about 250 million pounds of copper, brass and bronze. Furthermore, the government is likely to continue its stockpiling of strategic materials and this will withdraw from active use a large tonnage of copper. Brass mills were operating at the end of last year at about 90 per cent of the average for the previous three years.

STEEL's Metal Price Averages for Dec., 1949

(Cents per pound)

Electrolytic Copper, del. Conn.	18.500
Lead, St. Louis	11.800
Prime, Western Zinc, E. St. Louis	9.769
Straits Tin, New York	78.966
Primary Aluminum Ingots, del.	17.000
Antimony, f.o.b. Laredo, Tex.	32.000
Nickel, f.o.b. refinery	40.000
Silver, New York	73.250

Tin—Reconstruction Finance Corp., through its selling agency, the Tin Sales Corp., reduced its prices ½-cent a pound on Dec. 29 to the basis of 77.50c for Grade A brands. This brought reductions during December to 7½ cents a pound. Suppliers on the outside market promptly met the lower offering price of the government.

Supplies in the domestic market are more than sufficient to cover the comparatively small demands of consumers. At the close of 1949, more than 4000 tons were afloat to this country from Malaya, more than double the amount shipped during all of November.

Aluminum — Reynolds Aluminum Co. has purchased for $6 million the aluminum extrusion plant at Phoenix, Ariz. This is the fifth aluminum facility to be sold by the Administrator of General Services to Reynolds since Dec. 23. Original cost of the Phoenix plant was $34 million. It has a rated annual capacity of 60 million pounds of aluminum extrusions.

Mine Output Dips 11 Per Cent

Washington — Minerals and metals worth $13.9 billion were produced in the United States in 1949, Secretary of the Interior Oscar L. Chapman announces. Although this value was 11 per cent less than in 1948, it was the second greatest in history.

The huge mineral value reflects a general continuation of high unit prices, but also a mine tonnage unsurpassed in any war or prewar year.

Metals dropped 15 per cent in dollar output in 1949 because of steel and smelter strikes and the break in prices of base metals. A notable exception was the increase in domestic output of lead, a metal in short supply throughout the world. The smelting of iron, copper, zinc and silver decreased about 12 per cent in 1949, somewhat more than the general industrial decline. Output of aluminum and gold dipped only 4 per cent; a significant increase appeared in lead.

Copper smelter output dropped during the second quarter of 1949. Some recovery was achieved by year end but not to the March-April production level, for there was no general resumption of the 6-day work schedule. Mine production of copper was 11 per cent lower than in 1948. The labor strike at the Utah Copper mine, Bingham Canyon, Utah, affected production adversely from Oct. 24, 1948, through February, 1949. The sharp break in zinc prices interrupted some operations while labor and management were diciding how to distribute the lesser income from zinc operations. The 3 per cent increase in lead mine output, greatest since 1944, reflected the incentive of earlier higher prices and also fewer interruptions due to labor-management disputes.

Mining of domestic bauxite declined one-fourth in 1949. Production of aluminum during each of the first 7 months of 1949 exceeded output of the corresponding months of 1948, but strikes at reduction plants curtailed operations in August to December. Demand for primary magnesium increased substantially; fabricating costs were reduced. Notable progress was made during 1949 in the commercial development of titanium metal and alloys.

The slightly lower mine production of gold was principally in the byproduct segment of the industry and attributable to lower prices for base metals. The principal cause of the 11 per cent decrease in mine output of silver was a strike at the Bunker Hill & Sullivan smelter, Idaho.

Mercury mining was at such a low ebb in early 1949 that output for the year was expected to be the smallest in the century of record-keeping. However, the reopening of a major Nevada mercury mine in the latter half of the year retarded the fall. The sustained demand for pigments led to another record in shipments of titanium concentrates. Cadmium metal refining in 1949 was at a peacetime high.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 18.50c, Conn. Valley, Lake, 18.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 16.75-18.25c; 88-10-2 (No. 215) 25.25c; 80-10-10 (No. 305) 21.75c; No. 1 yellow (No. 405) 14.25-16.00c.

Zinc: Prime western 9.75-10.00c, brass special 10.00-10.25c, intermediate 10.25-10.50c, East St. Louis; high grade 10.85-11.10c, delivered.

Lead: Common, 11.80c; chemical, 11.90c; corroding, 11.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 16.50-17.00c; No. 12 foundry alloy (No. 2 grade) 16.25-16.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00-18.25c; grade 2, 17.50-17.75c; grade 3, 16.00-16.25c; grade 4, 15.50-15.75c. Prices include freight at carload rate up to 75 cents per 100 lb.

5% titanium-aluminum alloy No. 1 (low Cu) 31.00c; No. 2 (2% Cu) 28.00c, f.o.b. Eddystone, Pa.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt delivery, 77.50c; January arrival, 75.75c; February arrival, 74.50c; March arrival, 74.25c; April arrival, 73.75c. Chinese, 99% tin, prompt del., 73.50c.

RFC selling prices for prompt delivery, ex-dock New York or f.o.b. Texas City, Tex.: Grade A, 99.8% or higher (including Straits) 77.50c.

Antimony: American 99-99.8% and over but not meeting specifications below, 32.00c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 32.50c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99% (Chinese, English, Belgium), prompt, 26.00c, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $71-$74 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 73.25c per oz.

Platinum: $69-$72 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 18.50-cent copper.)

Sheet: Copper 32.18; yellow brass 28.69; commercial bronze, 95% 32.10; 90%, 31.61; red brass, 85%, 30.60; 80%, 30.12; best quality, 29.58; nickel silver, 18%, 42.27; phosphor-bronze, grade A, 5% 50.90.

Rods: Copper, hot-rolled 28.03; cold-drawn 29.28; yellow brass free cutting, 23.19; commercial bronze, 95% 31.79; 90% 31.30; red brass 85% 30.29; 80% 29.81.

Seamless Tubing: Copper 32.22; yellow brass 31.70; commercial bronze 90% 34.27; red brass 85% 33.51; 80% 33.03.

Wire: Yellow brass 28.98; commercial bronze, 95% 32.39; 90% 31.90; red brass, 85% 30.89; 80% 30.41; best quality brass 29.87.

Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots 22.55, l.c.l. 23.17, c.l. 22.67; weatherproof, f.o.b. eastern mills, 100,000 lb lots 24.85, l.c.l. 25.60, c.l. 25.10; magnet, delivered, c.l. 28.50, 15,000 lb or more 28.75, l.c.l. 29.25

ALUMINUM

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-24	36.8	33.4	39.5
0.008-0.0075	12-24	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	——Hexagonal—— 17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	36.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $17.00 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $17.00 per cwt. Traps and bends: List price plus 45%.

ZINC

Sheets, 15.50c f.o.b. mill, 36,000 lb and over. Ribbon znic in coils, 15.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 14.00c; over 12-in., 15.00c.

NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton, 27.00c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 28.84c; oval 28.34c; cast 26.87c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 46.50c f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.75c; over 250 lb, 24.75c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 100 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbls, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 94.00c, 500 to 999 lb, 94.50c; 200 to 499 lb, 95.00c; less than 200 lb, 96.50c; ball, 1000 lb and over, 96.25c; 500 to 999 lb, 96.75c; 200 to 499 lb 97.25c; less than 200 lb, 98.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 59.7c; 100 or 300 lb drums only, 100 to 500 lb, 51.4c; 600 to 1900 lb, 49.0c; 2000 to 9900 lb, 47.3c, f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 38.00c, f.o.b. Niagara Falls, N. Y.; 40.50c, f.o.b. Cleveland; 39.25c, del., Detroit and Philadelphia.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb 86.20c; more than 2000 lb, 84.20c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 72.59c; 100 lb kegs 73.59c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	15.50	15.50	14.75
Yellow brass	12.50	12.25	11.37½
Commercial Bronze			
95%	14.50	14.25	13.75
90%	14.25	14.00	13.50
Red brass			
85%	14.00	13.75	13.25
80%	13.62½	13.37½	12.87½
Best Quality (71-80%)	13.37½	13.12½	12.62½
Muntz Metal	11.50	11.25	10.75
Nickel, silver, 10%	14.50	14.25	7.25
Phos. bronze, A	16.75	16.50	15.50
Naval brass	12.00	11.75	11.25
Manganese bronze	12.00	11.75	11.12½

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 15.25; No. 2 copper 14.25; light copper 13.25; composition red brass 12.50-12.75; radiators 10.00; heavy yellow brass 9.50-9.75.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 15.25; No. 2 copper 14.25; light copper 13.25; refinery brass (60% copper) per dry copper content 13.50.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire, No. 1 13.50-13.75, No. 2 12.50-12.75; light copper 11.50-11.75; No. 1 composition red brass 11.00-11.25; No. 1 composition turnings 10.25-10.50; mixed brass turnings 6.25-6.50; new brass clippings 10.50-11.00; No. 1 brass rod turnings 9.25-9.50; light brass 6.00-6.25; heavy yellow brass 6.75-7.00; new brass rod ends 9.75-10.00, auto radiators, unsweated 8.50-8.75; cocks and faucets, 8.50-8.75; brass pipe 9.00-9.25.

Lead: Heavy 9.25-9.50, battery plates 4.50; linotype and stereotype 10.00-10.25; electrotype 9.00-9.25; mixed babbitt 9.25-9.50.

Zinc: Old zinc 4.25-4.75; new die cast scrap 4.00-4.50; old die cast scrap 3.00-3.25.

Tin: No. 1 pewter 42.00-42.50; block tin pipe 63.00-63.50, No. 1 babbitt 30.00-30.50.

Aluminum: Clippings 2S 10.50-11.00; old sheets 7.50-8.00, crankcase 7.50-8.00, borings and turnings 3.00-3.50.

DAILY PRICE RECORD

1949	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Jan. 3-5	18.50	11.80	9.75–10.00	77.50	17.00	32.00	40.00	73.25
Dec. Avg.	18.50	11.80	9.769	78.966	17.00	32.00	40.00	73.25
Dec. 29-31	18.50	11.80	9.75–10.00	77.50	17.00	32.00	40.00	73.25
Dec. 28	18.50	11.80	9.75–10.00	78.00	17.00	32.00	40.00	73.25
Dec. 19-27	18.50	11.80	9.75	78.00	17.00	32.00	40.00	73.25
Dec. 16-17	18.50	11.80	9.75	78.25	17.00	32.00	40.00	73.25
Dec. 14-15	18.50	11.80	9.75	78.75	17.00	32.00	40.00	73.25
Dec. 8-13	18.50	11.80	9.75	79.00	17.00	32.00	40.00	73.25
Dec. 5-7	18.50	11.80	9.75	80.75-81.00	17.00	32.00	40.00	73.25
Dec. 2-3	18.50	11.80	9.75	81.00	17.00	32.00	40.00	73.25
Dec. 1	18.50	11.80	9.75	83.00	17.00	32.00	40.00	73.25
Nov. Avg.	18.427	12.348	9.760	89.823	17.00	32.00	40.00	73.25

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, Jan. 5, 1950; gross tons except as noted. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Jan. 5	$26.83
Dec. 29	26.92
Dec. 1949	28.03
Jan. 1949	41.54
Jan. 1945	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$30.00
No. 2 Heavy Melt.	27.00-28.00
No. 1 Busheling	30.00
No. 1 Bundles	30.00
No. 2 Bundles	*25.00-26.00*
No. 3 Bundles	23.00-24.00*
Heavy Turnings	*26.00-27.00*
Machine Shop Turnings	*22.00-23.00*
Mixed Borings, Turnings	*23.00-24.00*
Short Shovel Turnings.	25.00-26.00
Cast Iron Borings	*24.00-25.00*
Low Phos. Steel	*34.00-35.00*

Cast Iron Grades*

No. 1 Cupola Cast	*34.00-35.00*
No. 1 Machinery Cast	*38.00-39.00*
Charging Box Cast	31.00-32.00
Heavy Breakable Cast.	27.00-28.00

Railroad Scrap*

No. 1 R.R. Heavy Melt.	*31.50-32.50*
Axles	*34.50-35.50*
Rails, Random Length	*35.50-36.00*
Rails, 2 ft. and under	*39.00-40.00*
Rails, 18 in. and under	*40.00-41.00*
Railroad Specialties	*34.50-35.50*
Angles, Splice Bars	*32.00-33.50*

* Nominal.

CLEVELAND

No. 1 Heavy Melt. Steel	$27.00-27.50
No. 2 Heavy Melt. Steel	24.50-25.00
No. 1 Busheling	27.00-27.50
No. 1 Bundles	27.00-27.50
No. 2 Bundles	22.50
Machine Shop Turnings	18.00-18.50
Mixed Borings, Turnings	19.50-20.00
Short Shovel Turnings.	19.50-20.00
Cast Iron Borings	19.50-20.00
Low Phos.	29.00-29.50
Cut Structurals	30.00-30.50

Cast Iron Grades

No. 1 Cupola	42.50-43.50
Charging Box Cast	36.50-37.50
Stove Plate	35.50-36.50
Heavy Breakable Cast.	33.50-34.50
Unstripped Motor Blocks	31.00-32.00
Brake Shoes	28.50-29.50
Clean Auto Cast	43.50-44.50
No. 1 Wheels	37.50-38.50
Burnt Cast	31.50-32.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-33.00
R.R. Malleable	38.50-39.00
Rails, 3 ft and under	43.00-44.00
Rails, 18 in. and under	44.00-45.00
Rails, Random Lengths	38.00-39.00
Cast Steel	34.00-35.00
Railroad Specialties	35.00-35.50
Uncut Tires	36.00-37.00
Angles, Splice Bars	40.00-41.00

VALLEY

No. 1 Heavy Melt. Steel	$30.00-30.50
No. 2 Heavy Melt. Steel	28.00-29.00
No. 1 Bundles	30.00-30.50
No. 2 Bundles	23.50-24.50
Machine Shop Turnings	20.50-22.50
Short Shovel Turnings	22.50-23.00
Cast Iron Borings	21.50-22.00
Low Phos.	31.50-32.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-33.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	*$23.50*
No. 2 Heavy Melt. Steel	*21.50-22.00*
No. 1 Busheling	*21.50-22.00*
No. 1 Bundles	*23.50*
No. 2 Bundles	*18.00-19.00*
Machine Shop Turnings	*16.50*
Short Shovel Turnings.	18.50
Mixed Borings, Turnings	*15.50*
Bar Crop and Plate	25.50-26.50
Punchings & Plate Scrap	25.50-26.50
Cut Structurals	25.00-26.00
Elec. Furnace Bundles	*25.00-25.50*
Heavy Turnings	24.00
No. 1 Chemical Borings	29.00

Cast Iron Grades

No. 1 Cupola Cast	*32.00*
No. 1 Machinery Cast.	36.00-37.00
Charging Box Cast	*34.00*
Heavy Breakable Cast	*34.00*
Unstripped Motor Blocks	*27.00*
Clean Auto Cast	37.00
No. 1 Wheels	*36.00-37.00*
Malleable	39.00

CINCINNATI

No. 1 Heavy Melt. Steel	$27.00
No. 2 Heavy Melt. Steel	25.00
No. 1 Busheling	26.00
No. 1 Bundles	27.00
No. 2 Bundles	20.00
Machine Shop Turnings	14.00
Short Shovel Turnings.	17.00
Mixed Borings, Turnings	17.00
Cast Iron Boring	17.00

Cast Iron Grades

No. 1 Cupola Cast	40.00
Charging Box Cast	32.00
Heavy Breakable Cast.	34.00
Stove Plate	30.00
Unstripped Motor Blocks	22.00
Brake Shoes	22.00
Clean Auto Cast	40.00
Drop Broken Cast	43.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	30.00
R.R. Malleable	32.00
Rails, Rerolling	36.00
Rails, Random Length.	34.00
Rails, 18 in. and under	43.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	*$22.00-23.00*
No. 1 Bundles	*24.00-25.00*
No. 2 Bundles	*21.00-22.00*
No. 1 Busheling	*24.00-25.00*
Machine Shop Turnings	*14.00-15.00*
Mixed Borings, Turnings	*14.00-15.00*
Short Shovel Turnings	*16.00-17.00*
Cast Iron Borings	*17.00-18.00*
Punchings & Plate Scrap	*24.00-25.00*

Cast Iron Grades

No. 1 Cupola Cast	*33.00-34.00*
Heavy Breakable Cast	*29.00-30.00*
Clean Auto Cast	35.00-36.00

BUFFALO

No. 1 Heavy Melt. Steel	*$27.50-28.00*
No. 2 Heavy Melt. Steel	*25.50-26.00*
No. 1 Bushelings	*25.50-26.00*
No. 1 Bundles	*26.50-27.00*
No. 2 Bundles	*24.00-24.50*
Machine Shop Turnings	*18.00-18.50*
Mixed Borings, Turnings	*19.00-19.50*
Cast Iron Borings	*19.00-19.50*
Short Shovelings	*19.50-20.00*
Low Phos.	*29.00-29.50*

Cast Iron Grades

No. 1 Machinery	*37.50-38.00*
No. 1 Cupola	*35.00-35.50*
Malleable	*32.00-33.00*

Railroad Scrap

Rails, 2 ft. and under	*38.00-39.00*
Scrap rails	*35.00-35.50*
Specialties	*33.00-34.00*

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$20.50
No. 2 Heavy Melt. Steel	18.00-18.50
No. 1 Busheling	18.00-18.50
No. 1 Bundles	20.50
No. 2 Bundles	*16.50-17.50*
Machine Shop Turnings	11.00-12.00
Mixed Borings, Turnings	11.00-12.00
Short Shovel Turnings.	11.00-12.00
Punchings & Plate Scrap	20.00-21.00
Cut Structurals	20.00-21.00
Elec. Furnace Bundles.	20.00-21.00

Cast Iron Grades

No. 1 Cupola Cast	26.00-27.00
No. 1 Machinery	29.00-30.00
Charging Box Cast	26.00-27.00
Heavy Breakable	26.00-27.00
Unstripped Motor Blocks	*20.00-21.00*
Malleable	36.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$18.00-19.00*
No. 2 Heavy Melt. Steel	*17.00-17.50*
No. 1 Bundles	*18.00-19.00*
No. 1 Busheling	17.00-17.50
Machine Shop Turnings	*10.50-11.50*
Mixed Borings, Turnings	11.00-11.50
Short Shovel Turnings	13.00-14.00
Bar Crops and Plate	*20.00-21.00*
Punchings & Plate Scrap	*20.00-21.00*
Chemical Borings	19.00-19.50

Cast Iron Grades

No. 1 Cupola Cast	29.50-32.50
Mixed Cast	25.50-26.50
Heavy Breakable Cast.	26.50-27.50
Stove Plate	23.50-24.50
Unstripped Motor Blocks	19.50-20.50

CHICAGO

No. 1 Heavy Melt. Steel	$26.00-28.00
No. 2 Heavy Melt. Steel	24.00-25.00
No. 1 Bundles	*25.00-26.00*
No. 2 Bundles	22.00-23.00
Machine Shop Turnings	*17.00-18.00*
Mixed Borings, Turnings	*17.00-18.00*
Short Shovel Turnings.	19.50-20.50
Cast Iron Borings	*17.00-18.00*
Low Phos.	29.50-30.50
Elec. Furnace Bundles.	28.00-29.00
Heavy Turnings	23.00-24.00
Cut Structurals	29.00-30.00

Cast Iron Grades

No. 1 Cupola Cast	38.00-39.00
Clean Auto Cast	39.00-40.00
No. 1 Wheels	32.00-33.00
Stove Plate	32.00-33.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.50-29.50
Malleable	37.00-38.00
Rails, Rerolling	*39.00-40.00*
Rails, Random Lengths	*32.00-33.00*
Rails, 2 ft. and under.	39.00-40.00
Rails, 18 in. and under	40.00-41.00
Railroad Specialties	30.00-31.00
Angles, Splice Bars	34.00-35.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	24.50
No. 1 Busheling	24.00
No. 2 Bundles	22.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.00
Short Shovel Turnings.	19.00
Cast Iron Borings	18.00
Bar Crops and Plate	30.00
Cut Structurals	23.00

Cast Iron Grades

No. 1 Cupola Cast	34.00-35.00
Stove Plate	28.00-30.00
No. 1 Wheels	23.00-24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.00
R. R. Malleable	nominal
Rails, Rerolling	37.00
Rails, 3 ft. and under.	25.00-26.00
Angles and Splice Bars	31.00-33.00

ST. LOUIS

No. 1 Heavy Melt. Steel	*$29.00-30.00*
No. 2 Heavy Melt. Steel	*25.00-26.00*
Machine Shop Turnings	*14.00-15.00*
Short Shovel Turnings	*19.00-20.00*

Cast Iron Grades

No. 1 Cupola Cast	*35.00-36.00*
Charging Box Cast	*29.00-30.00*
Heavy Breakable Cast.	28.00-29.00
Brake Shoes	*29.00-30.00*
Clean Auto Cast	*36.00-38.00*
Burnt Cast	*28.00-29.00*

Railroad Scrap

R.R. Malleable	*27.00-28.00*
Rails, Rerolling	*36.00-37.00*
Rails, Random Lengths	32.00-33.00
Rails, 3 ft. and under	37.00-38.00
Uncut Tires	*27.00-28.00*
Angles, Splice Bars	*32.00-33.00*
Railroad Specialties	*29.00-30.00*

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00

Cast Iron Grades

No. 1 Cupola Cast	30.00-35.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Wheels	20.00
Rails, Random Lengths	20.00

SEATTLE

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	18.00
No. 1 Busheling	15.50
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	13.00
Mixed Borings, Turnings	13.00
Punchings & Plate Scrap	22.00
Cut Structurals	22.00
Elec. Furnace Bundles.	23.00

Cast Iron Grades

No. 1 Cupola Cast	25.00
Heavy Breakable Cast.	20.00
Stove Plate	20.00
Unstripped Motor Blocks	18.00
Malleable	20.00
Brake Shoes	18.00
Clean Auto Cast	25.00
No. 1 Wheels	25.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	19.00
Railroad Malleable	25.00
Rails, Random Lengths	19.00
Angles and Splice Bars	19.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	24.00
Elec. Furnace Bundles.	25.00

Cast Iron Grades

No. 1 Cupola Cast	28.00-30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	32.00

HAMILTON, ONT.

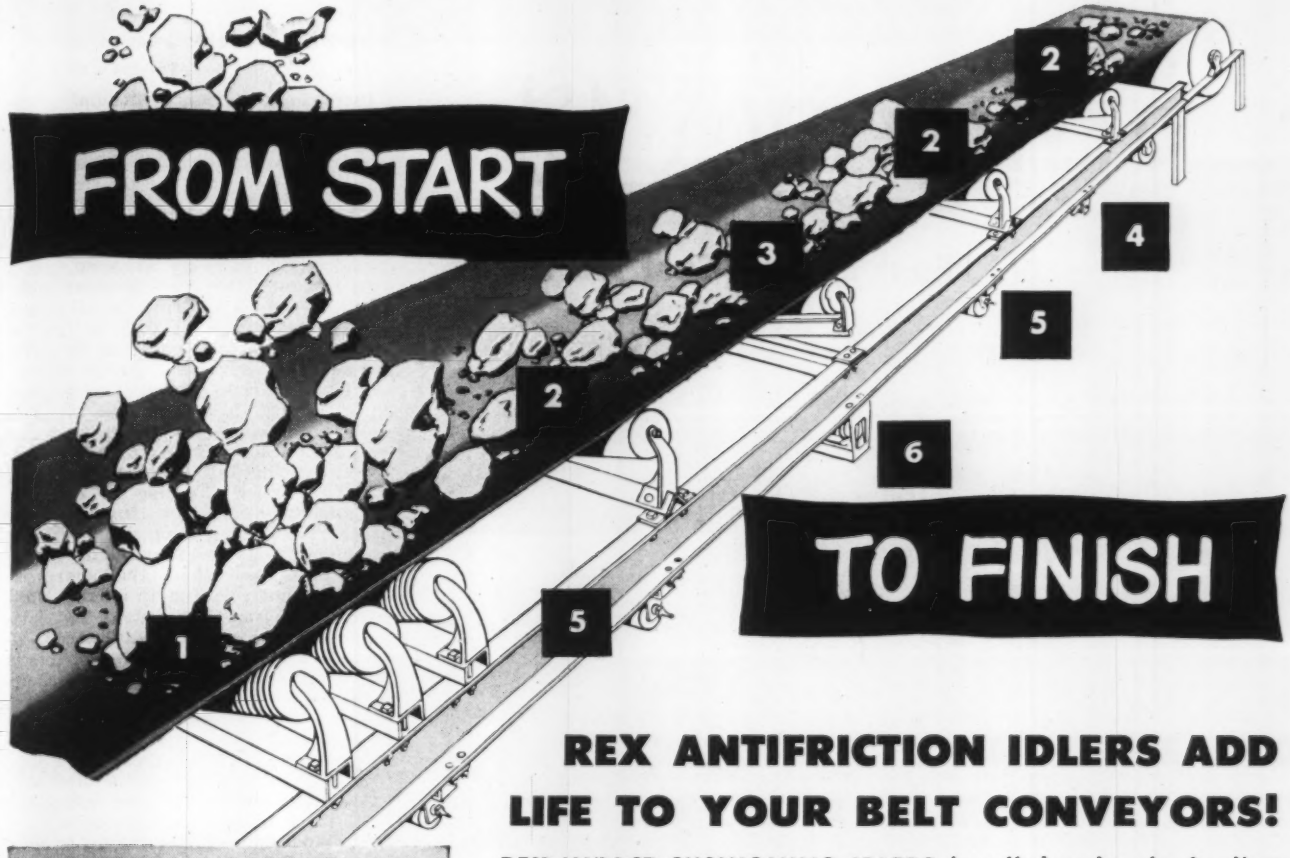
(Delivered prices)

Heavy Melt.	$24.00
No. 1 Bundles	24.00
Mechanical Bundles	22.00
Mixed Steel Scrap	20.00
Mixed Borings, Turnings	18.00
Rails, Remelting	24.00
Rails, Rerolling	27.00
Busheling	18.00
Bushelings new factory, prep'd	22.00
Bushelings new factory, unprep'd	17.00
Short Steel Turnings	18.00

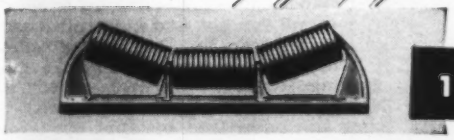
Cast Iron Grades*

Cast	40.00-43.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.

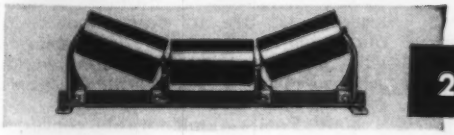


REX ANTIFRICTION IDLERS ADD LIFE TO YOUR BELT CONVEYORS!



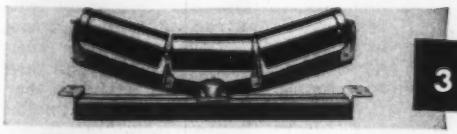
1

REX IMPACT CUSHIONING IDLERS installed under the loading points will take the bumps for your belts . . . minimize ruptures and lacerations. Dual-purpose rubber rolls are scientifically molded with deep primary grooves for maximum cushioning and secondary grooves that provide surface softness to avoid belt laceration.



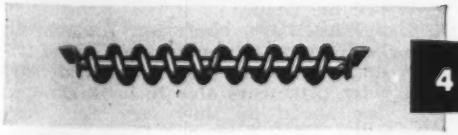
2

REX TROUGHING IDLERS insure minimum service cost and maximum equipment life. Belt friction wear is practically eliminated, and the closely spaced, well-balanced roll units provide an idler assembly that is kind to the belt. There is a type and style for every application.



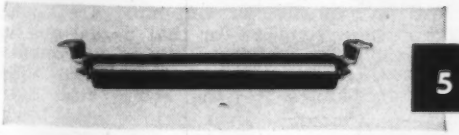
3

REX SELF-ALIGNING TROUGHING IDLERS automatically align belts without the need for side-guide idlers that impose excessive belt edge wear. They eliminate the misalignments caused by off-center loading, side-wind drifting, warped frames or uneven belt stretch. These idlers fit any belt conveyor frame.



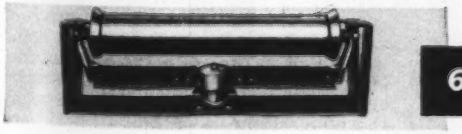
4

REX RUBBER-COVERED SPIRAL RETURN IDLERS create an ever-changing point of contact between belt and idler. Ice, abrasive, corrosive and sticky material cannot build up on the idler and cause premature wear and operating difficulties.



5

REX RETURN IDLERS are dead or live shaft type idlers with hydraulic type fittings for high pressure grease lubrication. They are sturdily built, and their smooth-rolling action cuts belt wear to the minimum.



6

REX SELF-ALIGNING RETURN IDLERS assure automatic belt alignment on the return run. They are similar in general design and effectiveness to the Rex Self-Aligning Troughing Idler.

For complete details on these and the many other idlers in the complete Rex line, write for your copy of Bulletin 463-R. Chain Belt Company, 1660 West Bruce Street, Milwaukee 4, Wisconsin.

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Look at All

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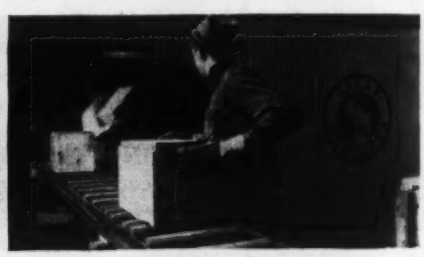
— Order and cleanliness — freedom from congestion — smooth flowing coordinated movement of commodities — these are the plus advantages of roller or belt conveyors, gravity or power, in addition to their time, money, and manpower economies.



2 with the EXTENDOVEYOR

— compact, mobile, easily maneuverable power-belt conveyor unit—handles packages up to 150 lbs.—reaches into cars, trucks, trailers. Available in 4 sizes — 2 models.

3 with PORTABLE ROLLER CONVEYOR

— light, easy to carry and set up where needed. Standard Litewate Sectional Roller Conveyor is a great time and labor saver in loading, unloading, storing commodities. Available in 5 ft. and 10 ft. sections — straight and 90° or 45° curves.

4 with PNEUMATIC TUBE SYSTEMS

— provide swift, sure, safe transportation of messages, documents, blueprints, samples, small parts, money; cylindrical or oval tubes 1½ inch upward with dispatching and receiving terminals for complete systems to meet your needs. Write for special bulletin SPT.

Write for Standard's general Catalog No. ST10. Tell us what you want to handle or name equipment on which you want more information.

STANDARD CONVEYOR COMPANY
North St. Paul 9, Minn.
Sales and Service in Principal Cities

Sheets Strip . . .

Sheet and Strip Prices, Page 85 & 86 & 87

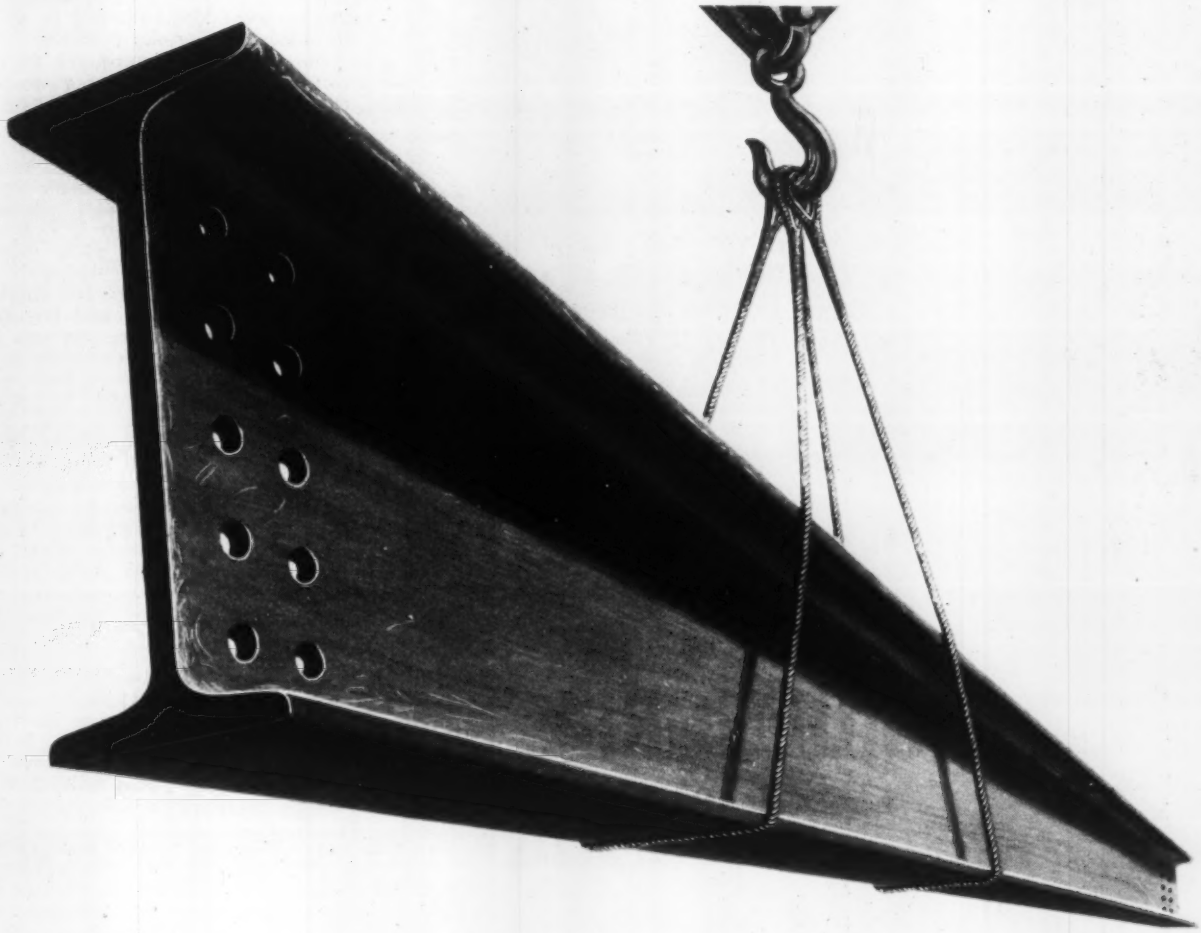
Pittsburgh—Two additional cold-rolled strip producers in this area have advanced base prices in the lower carbon range $3 per ton, retroactive to Dec. 19. Major producers have not yet announced new base price schedules for the higher carbon cold-finished spring steels, but undoubtedly will do so soon. It is pointed out that the present price for cold-finished spring steel within the carbon range of 0.25 to 0.40 of $4 per 1000 pounds is out of line with the recently advanced quotations for the lower carbon range. The average advance of $8.50 per ton in hot-rolled strip extras approximates the increases announced by nonintegrated producers in late 1948, but which were rescinded because of competitive conditions last spring. Nonintegrated cold-rolled strip producers get the benefit of the $3 per ton higher base price to offset the sharp increase in hot-rolled strip extras. However, no increase in extras for cold-rolled strip has been announced, although this is considered probable in the near future. Sharon Steel Corp. is now quoting one base price on hot-rolled strip. Previously this concern had a price differential between 6 inches and narrower, and wider than 6 inches. Revisions in hot-rolled strip extra schedule no longer make this base price differential necessary.

Philadelphia—Little easing is noted in demand for hot and cold-rolled and galvanized sheets. Despite extended delivery promises consumers are still striving to get on mill schedules. Many are inquiring actively with a view to benefitting by spot openings. Specialties, such as stainless and alloy sheets, are in only modest demand. Some producers are able to ship stainless in three to four weeks. Alloy grades are available in six to eight weeks.

New York—Considerable confusion prevails in the sheet market with respect to extras, not only among buyers, but sellers as well. There have been instances of two and three revisions by producers within a short time and it will be at least another few weeks before adjustments will become final.

While this confusion undoubtedly is deferring the placing of some tonnage, there is still a lively demand with producers able to book about as far ahead as they care to. Some mills haven't opened their books for second quarter, but most are taking some tonnage for that period and, in certain instances, sufficient quantities of major grades to fill their schedules for the entire first half.

Chicago—With rigid quotas being adhered to by local producers of sheets there is virtually no way of telling how much more business could be booked in first quarter and beyond. However, it is believed that as soon as the pent-up demand occasioned by the steel strike is satisfied operations will slip back to the rates prevailing before the strike. There is also some feeling in metalworking circles that high level production in many industries will be concentrated in the first half of the year with the possibility that by midyear many companies may be faced with a finished product in-



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SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS **MULTIGRIP FLOOR PLATE**

UNITED STATES STEEL

ventory problem. For the time being, procurement of materials is an immediate and serious problem.

Cleveland — Demand for the flat-rolled products continues unabated though some confusion is evident among buyers with respect to the new extras which now apply on shipments. Indications are it will be some time before the situation is completely clarified. Meanwhile, producers' books are loaded with first quarter tonnage and all the signs point to heavy first half specifying.

Cincinnati—Pressure for sheet deliveries is unrelaxed, and buying interest continues high, although mills are not setting up schedules beyond the first quarter. New base prices have been established by district mills, with revision of extras following closely that of others in the industry.

Los Angeles — Automotive and warehouse demand is giving an increasingly strong undertone to sheet and strip requirements, which generally are at their best level in months.

Plates . . .

Plate Prices, Page 85

New York—Plates are moving so slowly some mills can make delivery against new orders this month. All leading eastern plate mills have adjusted their price schedules. Four have advanced their base prices $2 a ton on carbon plates, and the fifth, at Harrisburg, Pa., has reduced its price $5 a ton. Thus, Lukens Steel Co., Worth Steel Co., and Alan Wood Steel Co. are quoting on a mill base of 3.60c, while Central Iron & Steel Co., and Bethlehem Steel Co. are quoting 3.50c, mill.

Boston — Plate requirements are heavier for large diameter pipe. In other directions pickup in plates is slow, lagging behind third quarter, or prestrike levels. Only a few large-tonnage projects are out. Deliveries are from three to four weeks on carbon plates with heads extended one to two weeks beyond plates.

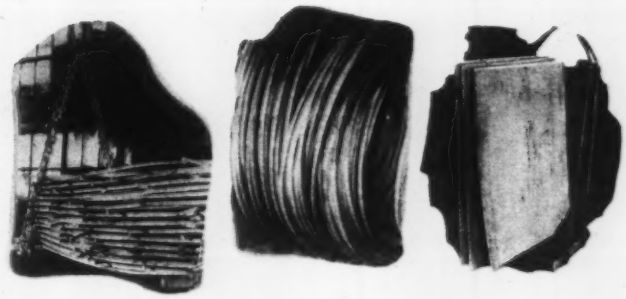
Philadelphia—Competition for business is keen in the plate market. Indications are one eastern mill not only is absorbing freight to meet the delivered Philadelphia price, based on the two nearest producing mills, but is shading it. Most district mills can still make deliveries within three to four weeks. Some tightening in the situation will result, however, when the Lukens Steel Co., Coatesville, Pa., suspends operations at its largest mill for electrification.

Chicago—Demand for plates has picked up somewhat in recent weeks, these having been a relatively soft spot in mill sales. Demand does not seem to center in any particular industry, although warehouse buying of lighter gases has some urgency.

Los Angeles—Although pipeline and tank requirements are steady, plate demand is stiffening noticeably as distributors and miscellaneous fabricators replenish depleted inventories. Deliveries have been extended, now range 4 to 6 weeks.

Seattle—Demand for plates is slow and fabricating operations have been reduced. Prospects for first quarter are not promising.

To remove scale from bar, wire, sheet...



Stainless steels, tool steels, copper, nickel, in fact, any metal, alloy or bimetallic which does not react with molten caustic and whose physical characteristics are not adversely affected at 700°F., can be uniformly descaled, easily and quickly. Different grades can be treated simultaneously. Usual racking methods are sufficient.

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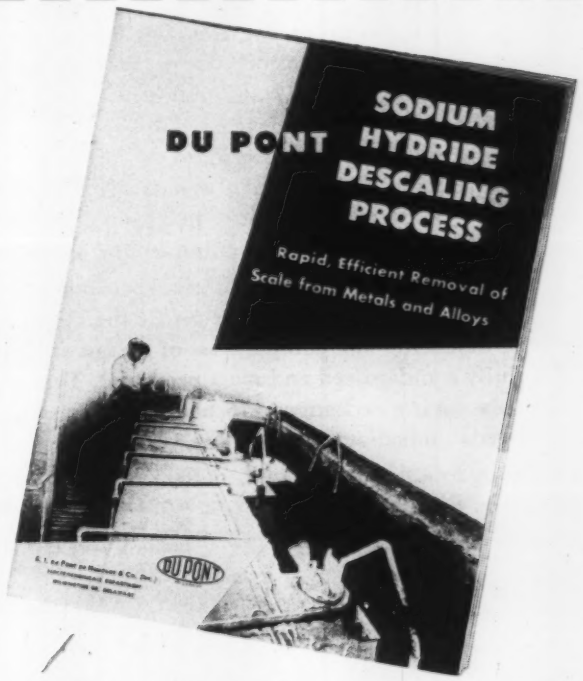

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Steel Bars . . .

Bar Prices, Page 85

New York—Hot carbon bars are in moderate demand; most delivery promises now fall in early Febraury on the larger sizes and late February and early March on the smaller This is especially true on quotations by mills to regular customers; to other than regular customers, delivery promises are more extended in some instances. Cold-drawn carbon bars are available in some instances before the end of the month, but generally in February. Hot alloy bars are being generally quoted for early February shipment; cold alloy, February and March.

Pittsburgh—Wyckoff Steel Co., effective Dec. 30, advanced cold-finished alloy bar prices $5 per ton to $4.90 per 100 pounds at Ambridge, Pa., and Chicago, and $5.20 at Newark. On Jan. 3, Columbia Steel & Shafting Co. took similar action to $4.90 base at Carnegie, Pa. In advancing its cold-finished carbon bar prices $3 per ton Jones & Laughlin has maintained the $1 differential below other Pittsburgh interests by quoting $4.10 per 100 pound base at Pittsburgh. Other coldfinishers soon are expected to adopt similar cold-finished alloy price base. There will be no change in size extras for cold-finished alloy rounds, hexagons and squares. However, there is a slight change in size extras on a few brackets involving flats, as well as other processing extras. Quantity extras have been revised affecting brackets under 6000 pounds.

Cleveland — Merchant bar buyers are specifying steadily against old orders but new buying is not too pressing. Mills can accept tonnage for shipment in first quarter, bars being in less tight supply position than the flat-rolled products.

Chief interest in the market at present centers in the new extra cards being issued by the mills. Converters are finding the increases in extras quite sharp. Meanwhile, upward adjustments in base prices continue to be made. Last week several area producers, including American Steel & Wire Co. announced an increase of $3 per ton to 4.15c mill on cold-finished bars.

Boston—Having covered fairly well for this quarter, carbon bar consumers are reviewing orders with objective of avoiding more costly extras where possible. This results in changes in specifications.

Philadelphia—Demand is fairly sustained with backlogs a shade heavier. Hot carbon bars are now being offered around five to eight weeks, depending on size. Alloy bars can be had in five to seven weeks. Cold-drawn bars are still available in some quarters for shipment before end of this month. A notable feature is improved demand from government arsenals.

Huntington, W. Va.—West Virginia Steel & Mfg. Co., has advanced rail steel bars $2 per ton to $3.45 per 100 pound base, and light rails (rail steel) $4 per ton to $3.75.

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Tubular Goods . . .

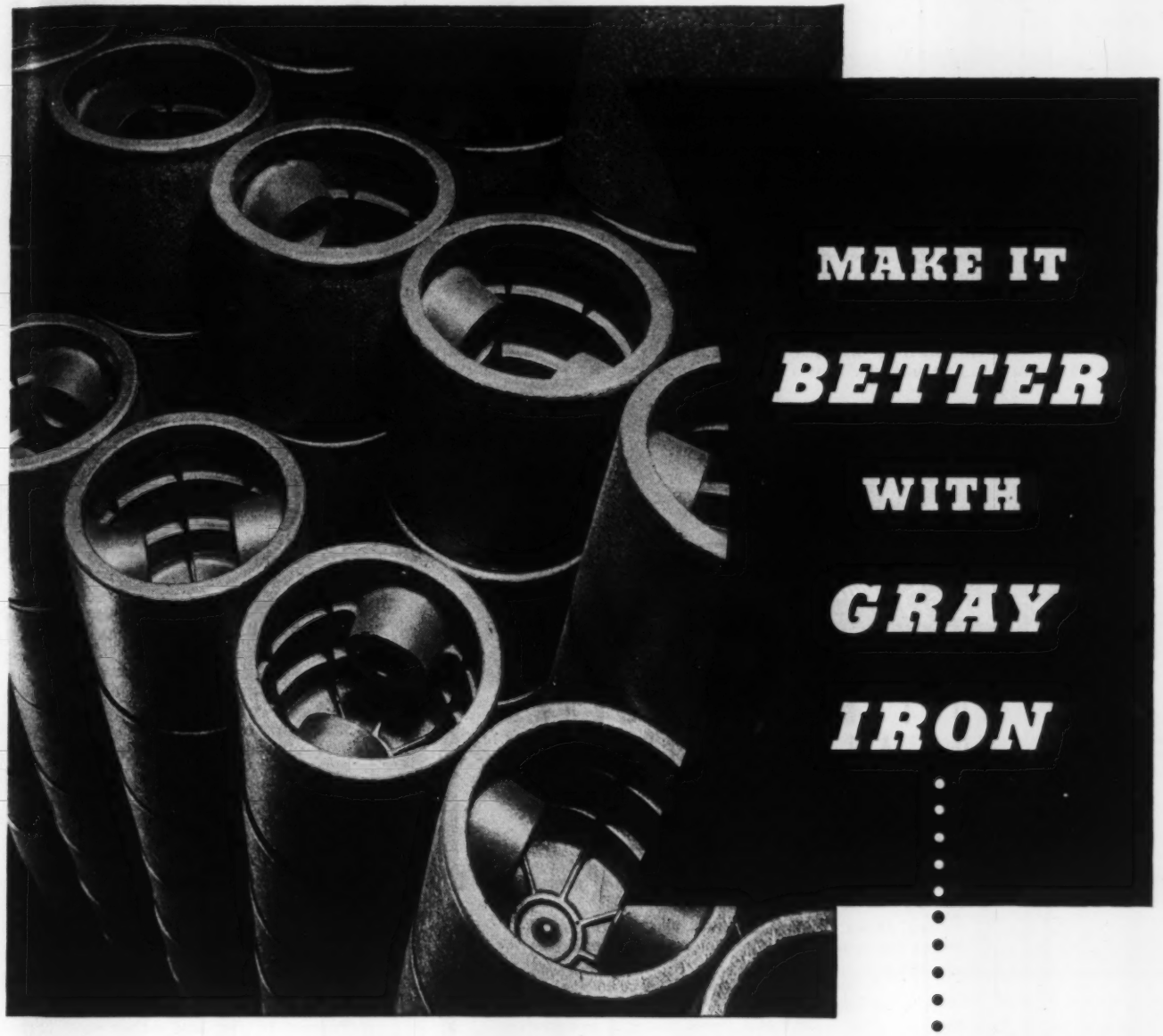
Tubular Goods Prices, Page 88

Boston—New orders for merchant steel pipe are being entered for March with first two months this quarter largely blanked out by some mills due to carryovers. Distributors' volume of business has slackened with new commitments lighter, although pressure for delivery against deferred volume is steady. Secondary inventories are unbalanced and efforts are being made to correct this situation for the seasonal spring upturn. While little, if any, pipe volume has been placed for bringing natural gas into New England, utilities are figuring tentative lateral needs. Parallel 18-inch oil line, Portland-Montreal starts this spring, seamless pipe to be furnished by a midwest mill through revision of an earlier allocation to an oil company involved.

Babcock & Wilcox Tube Co. has increased base quantities on carbon steel pressure and mechanical tubing 7½ and 6 per cent, respectively; alloy pressure and mechanical tubing up 3 to 6 per cent dependent on grade and specifications.

Los Angeles—Urgency of pipe needs is becoming more pronounced, and is spreading through a wide range of sizes, indicating considerable warehouse buying.

Seattle—Cast iron pipe market is dormant and sales agencies see no prospect of immediate revival. Seattle and Tacoma have reverted to the prewar plan of awarding jobs to contractors, who in turn furnish materials, rather than maintain stocks.



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Wire . . .

Wire Prices, Page 87

Pittsburgh—The new schedule of extras for carbon-manganese content has been established on wire rods, covering cold-heading, cold-forging and cold-rolling quality, as follows: Low carbon (0.15 per cent maximum carbon and 0.60 per cent maximum manganese) 50 cents; medium low carbon (over 0.15 per cent to 0.23 per cent maximum carbon and 1 per cent maximum manganese) 50 cents; medium high carbon (over 0.23 to 0.44 per cent maximum carbon and 1.65 per cent maximum manganese) 75 cents; high carbon (all carbon over 0.44 per cent) 75 cents per 100 pounds. These extras previously were 50 cents. A new extra of $8 per ton has been established on fine wire quality rods; $5 for chain quality and coat or garment hanger quality. Nut quality stock extra for cold punched nuts was $5 per ton, now $15. Chemical extras have been revised as: Former extra of $2 per ton has been increased to $5 for the sulphur extras up to 0.13 per cent maximum for resulphurized steels; previously the extra was applicable up to 0.12 per cent sulphur max. In any carbon range where the silicon maximum is 0.35 per cent or less and carbon 0.28 per cent maximum or less the silicon extra is now $3 per ton; previously no extra was charged. Heat treating extras on hot-rolled rods also advanced as follows: Annealed in coils, normalized and spheroidized annealed up $4 per ton; patented raised $2 per ton.

Heat treatment extras on MB spring wire revised as: Elimination of black annealed extra of 50 cents, and annealed and cleaned extra of 75 cents per 100 pounds. A new extra of 40 cents per 100 pounds has been established for cleaned and coated or cleaned and oiled for 13 gage and coarser; 55 cents for 14 and 15 gage. A schedule of extras also established for soft drawing after spheroidizing as follows: 7 gage and coarser $2.40; 8 to 14 gage, $2.60; and 15 to 19 gage, $3.50 per 100 lb.

Heat treating extras for low carbon wire have been advanced $4 per ton for black or pot annealed; salt annealed, lime bright or bright annealed; drawn from annealed rods, normalized rods or spheroidized rods; spheroidized also up $4. Extras for annealed in process bright soft wire have been advanced on per 100 pound basis as follows: 20 cents for 14 gage and coarser; 60 cents for 15 to 19 gage; spheroidized in process 45 cents for 14 gage and coarser; 85 cents for 15 to 19 gage.

Weaving wire tinning extras for 16 gage tinned hard are advanced $1.75 per 100 pounds and $1.50 for tinned soft. Tinning extras for other gages also substantially advanced.

The same schedules on carbon and manganese content have been established on bright manufacturers wire. The cleaned and lime coated or cleaned or oiled extra advanced $2 per ton in gage range from 13 and coarser to 15 gage; new extras established up to and including 20 gage as follows on 100 pound basis: 17 gage, 75 cents; 18 gage $1; 19 gage, $1.15; and 20 gage, $1.50. Quality extras revisions are same as on wire rods with few exceptions.

Boston—On some specialties, wire producers are booked into second quarter, but there are openings for delivery before Apr. 1 on manufacturers' bright and other low carbon grades with size frequently fixing shipment period. Although there are some deferments in releases against valve spring wire for the automobile trade, overall demand holds up well.

Los Angeles—Despite continued strong demand for merchant wire, seasonal slackening in automotive requirements during model changeover period has eased pressure on wire producers.

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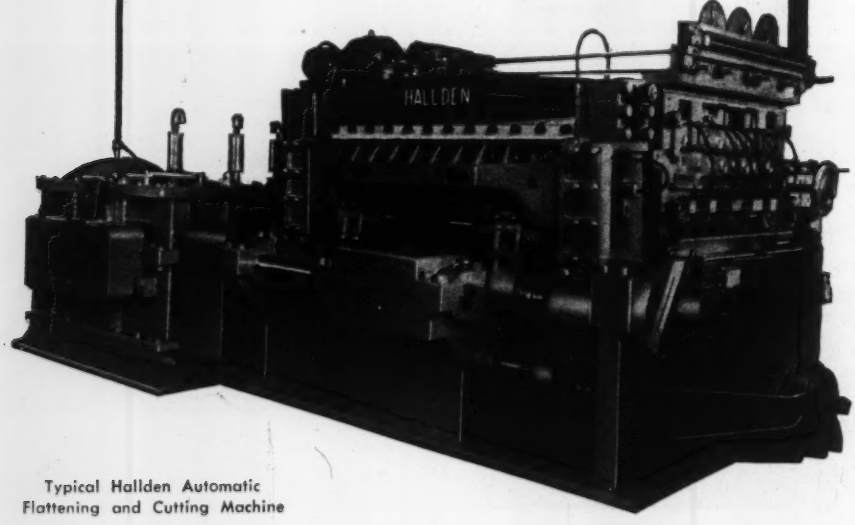


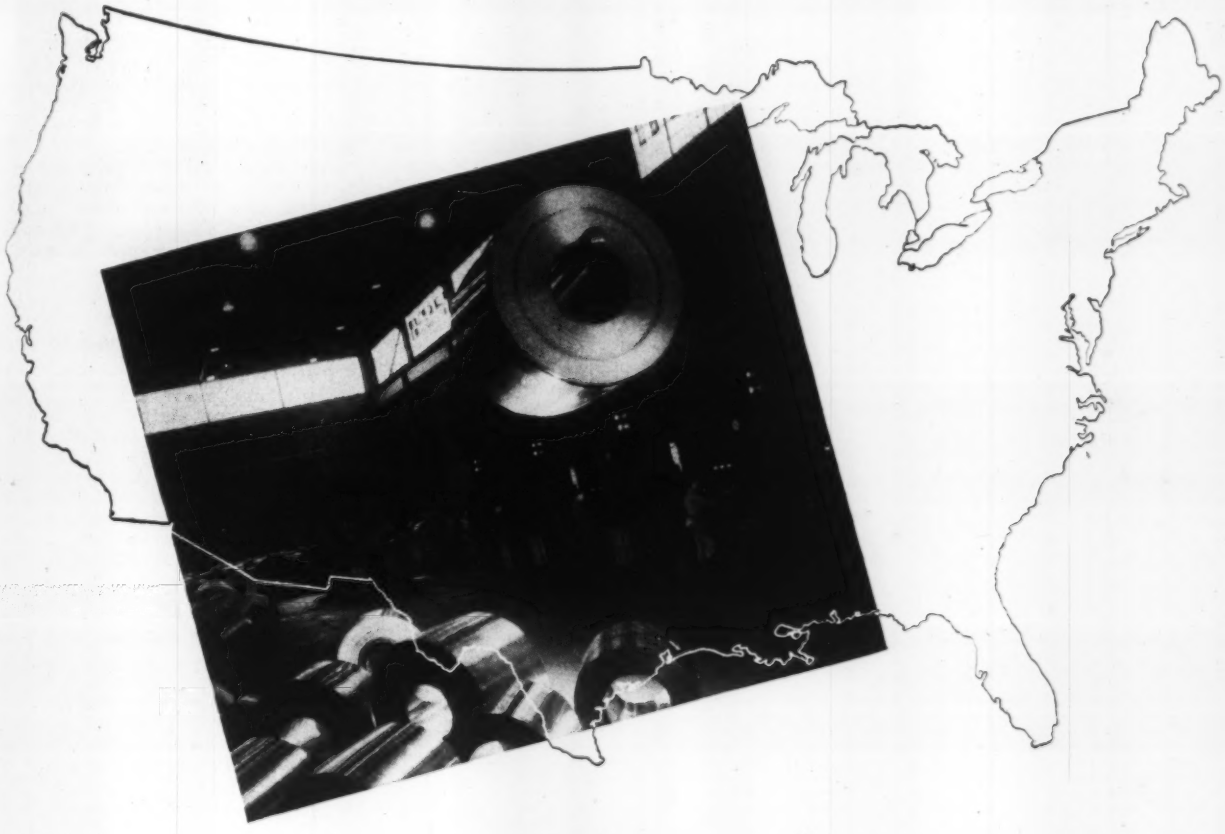
Typical Hallden Automatic Flattening and Cutting Machine

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 85

Los Angeles—Although demand for reinforcing rods currently is a little wobbly, observers expect a renewed upsurge in coming months. Engineering construction awards in southern California, southern Nevada, and Arizona, totaled $34.8 million during November, the highest for any month in the past 11 years.

Seattle—Local rolling mills have resumed limited operations after a holiday shutdown. Northwest Steel Rolling Mills Inc. has accumulated an ingot stock as furnaces operated while its mill was closed. Order backlogs for reinforcing bars are not impressive.



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Structural Shapes . . .

Structural Shape Prices, Page 85

New York—Structural awards are light and spotty. Outstanding is the placing by Massachusetts Mutual Life Insurance Co. of 4600 tons for an office building here. Considerable work is in prospect, especially public work which includes road and bridge construction and housing developments. New Jersey is in the midst of financing a large super-highway program which will eventually require at least 100,000 tons of structural material; some work in this connection is up for bids this month.

Boston—While higher cost of plain material points to firmer fabricated structural steel prices, current quotations are still at postwar lows or roughly half peak levels. Competition for public works tonnage, accounting for bulk of activity, is keen with district shops estimating bridge work more frequently. Low on one 245-ton state structure recently was under 7 cents per pound for steel in place.

Philadelphia—While awards are relatively light, structural inquiry is broadening with prospects for more active business later. Fabricators are competing sharply for such tonnage as is now being placed in an effort to keep backlogs from undergoing further shrinkage.

Chicago—Contrary to the widely held belief that an upturn in structural buying will be seen this spring, some producers hold that fabricators' backlogs generally will decline and that standard shapes will be in only moderate demand.

San Francisco—Demand for structural shapes is light, only small jobs keeping the market alive. Current trend is partly seasonal, and builders are hopeful of a revival in spring.

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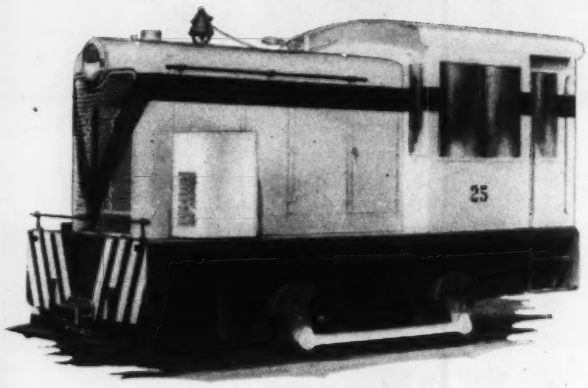

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Tool Steel . . .

Tool Steel Prices, Page 87

Pittsburgh — Allegheny Ludlum Steel Corp., Firth Sterling Steel & Carbide Corp. and other tool steel producers have followed the 10 per cent increase in base prices and extras initiated by Latrobe Electric Steel Co. on Dec. 23. Allegheny Ludlum's action was taken Jan. 3 and Firth Sterling on Jan. 1. Extra revisions include upward adjustments in charges for annealing, size, cutting, quantity, special shapes and special heat treatment.

Philadelphia—Eastern tool steel price schedules are being advanced. Bethlehem Steel Co. has increased tool steels, small tools and tool holder bits about 10 per cent, effective Jan. 1. No change is reported in mining and quarrying tools. Carpenter Steel Co. has increased tool steels about 10 per cent.

Ferroalloys . . .

Ferroalloy Prices, Page 89

New York—Domestic price adjustments applicable beginning Jan. 1 were announced last week by Climax Molybdenum Co. on molybdic oxide and ferromolybdenum. Prices on other products produced by the company remain unchanged.

The company now quotes molybdic oxide, bagged, 94 cents per pound of molybdenum contained, a decline of 1 cent. At the same time ferromolybdenum was increased from $1.10 to $1.13 per pound of molybdenum contained.

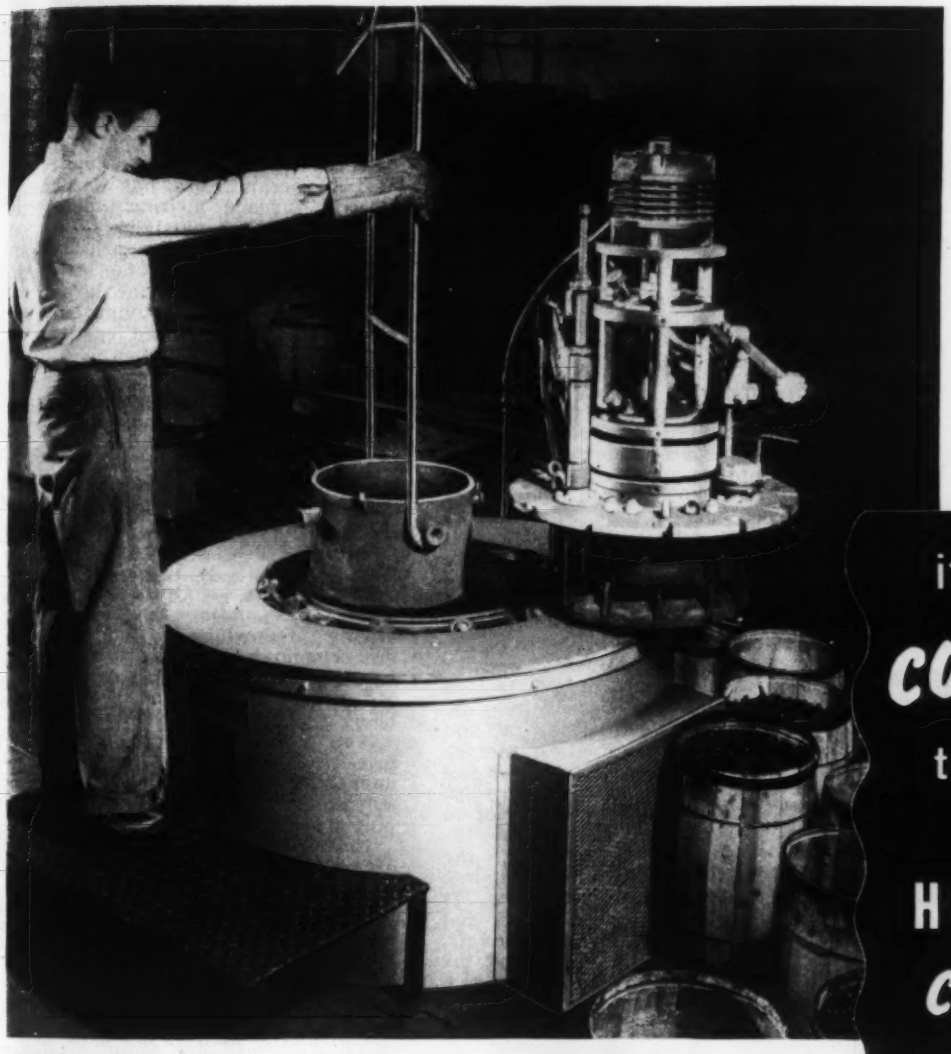
Pig Iron . . .

Pig Iron Prices, Page 84

Boston—Expected improvement in pig iron demand has not materialized although shipments are ahead of last month. With Everett furnace prices on malleable and No. 2 foundry unchanged for first quarter, melters have not moved toward adding to inventories which, in most instances, are rather low. So is melt.

Philadelphia—Restricted coal operations have not yet affected district pig iron production but are resulting in an increasing shortage of furnace coke of good standard quality. Recognition of this situation is causing consumers to step up demands. However, curtailed coal mining has not resulted in any special quickening in pig iron specifications.

Cincinnati—Ordering of foundry iron for January delivery is slow, due to present slow operations. Inventory position of most melters also precludes a rush to make near commitments.



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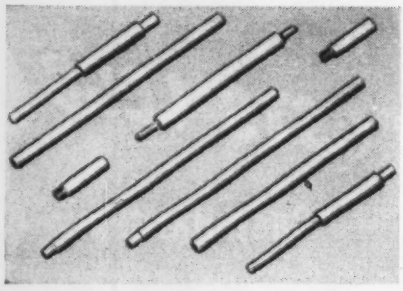

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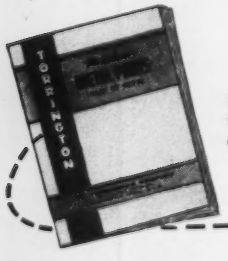

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Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 88

Cleveland—Bolt and nut producers are issuing new discount schedules but the pricing situation is still in a confused state with only a few interests' new cards issued to date.

The Lamson & Sessions Co., this city, effective Jan. 3, issued a complete new schedule on carriage, machine and lag bolts; cold punched, hot-pressed and semifinished nuts, and cap screws (See page 21) which represents a radical change from previous pricing.

Under the new method chain discounts formerly quoted and which represented additions to the base discount are discontinued. Now separate net discounts are quoted on less than case quantities, full case quantities, orders for 20,00 pounds, and orders for 40,000 pounds.

Terms of delivery for hot-pressed and cold-punched nuts are f.o.b. the company's plants. The same applies on carriage and machine bolts. However on semifinished nuts, delivery terms call for f.o.b. seler's plants with actual rail and water freight alowed on shipments of 200 pounds over, not to exceed 65 cents per 100 pounds. On bulk quantities of cap and set screws terms call for f.o.b. factory with actual tariff rate of rail, or rail and water freight allowed on shipments of 200 pounds or over, not to exceed 65 cents per 100 pounds.

A leading rivet producer, the Champion Rivet Co., Cleveland, last week announced a price advance. It now quotes large rivets ½ in. and larger 7.25c base, and small rivets, 7/16 in. and smaller 43 per cent off list. Prices are f.o.b. Cleveland and, or freight equalized with Pittsburgh; f.o.b. Chicago, and, or freight equalized with Birmingham except in cases where the freight equalization is too great.

Scrap . . .

Scrap Prices, Page 92

Pittsburgh—Recent purchases indicate a leveling off in scrap quotations with No. 1 heavy melting firmly established at $30. There is no longer persistent pressure for lower quotations. Further weakness has developed in cast scrap despite prospect of higher pig iron prices resulting from rumored pending increase in iron ore prices. Railroad list awards are expected to be below prices received last month in line with the $30 level established on industrial heavy melting scrap.

Detroit — A new era has been ushered into the scrap business with the turn of the year, marked by a cautious and quiet buying policy on the part of most leading mills. No open orders are being placed and buyers will not act until the scrap is actually owned by the seller, putting an end to large short ordering on the part of brokers, at least temporarily in some opinion. As a result, the market has firmed at lower levels, off from $1 to $3 a ton. Melters are comfortably fixed for the most part and are insisting on a "completely wrapped-up package" for future buys. It is believed mills would like to see the market stabilized at around $30, Pittsburgh, and are trying to orient buying policies to avoid sharp prices swings such as have been experienced in the past six months. Many dealers, particularly the smaller ones, are caught in a squeeze on No. 2 bundles, since there are few takers for this material, the preference being for choice quality industrial scrap. Ford has suspended electric furnace melting operations which had been partially scheduled for the past several months. Clean auto cast is showing some strength, due to the policy of one large upstate auto foundry of buying only old blocks instead of mixed cast.

Chicago—Although given very little encouragement by local mills, end of the order famine appears nearing. Scattered purchases from out-of-town mills, buying of a few grades locally, and knowledge that present operating rates cannot long be sustained without more scrap buying spurred this belief. Good cast continues to command a price ni the neighborhood of $39.

Philadelphia — Open-hearth steel scrap prices continue to ease on light buying. Meanwhile the leading eastern consumer has held up shipments to all plants except Sparrows Point, Md., where modest tonnages are still being accepted.

New York—Scrap brokers' buying prices for steel grades are generally unchanged. An exception is a lower spread of $16.50-$17.50 f.o.b. shipping point for No. 2 bundles.

Boston—Demand for steelmaking grades is dull, notably for outside shipment with purchases by district consumers confined to small spot lots. Cast scrap also is moving in limited volume with prices untested. Undertone of prices for steel scrap is weak with No. 2 heavy melting listed at $17 shipping point.

Cincinnati—Melters are slow to reenter the market for iron and steel scrap, following a dull period during the holidays. This factor, and others, are creating a softening of prices although revision downward is delayed pending adequate test.

Cleveland—Scrap market remains unusually quiet in view of the high rate of consumption at steel mills. Some interests believe mills will enter the market for substantial tonnages by the close of this month; others, that they will be able to hold off until early February. Operations at foundries are spotty and on the low side. All prices are steady with No. 1 heavy melting at $27-$27.50, delivered.

St. Louis—Scrap prices are drifting lower due to light demand. In the last two weeks nearly all items have been marked down by brokers. Shipments are substantial. Mills now are stocked through January.

Los Angeles—Mill buying is slow to moderate, with price schedules unchanged for January.

Seattle—Bethlehem Pacific Coast Steel Corp., which has been out of the market for several weeks, plans to buy sparingly in January, possibly less than consumption. Scrap sales were exceptionally low in December. No. 1 heavy melting is unchanged at $18, while No. 1 cupola cast is quoted at a maximum of $25. Foundry operations are seasonally slow and materials are being bought only in small tonnages.

Warehouse . . .

Warehouse Prices, Page 89

Pittsburgh—Leading steel distributors have advanced prices. The increase in warehouse base prices are, in some instances, substantially higher than advances initiated by the mills due to higher mill extras. Where possible the increase in mill extras have been passed on to warehouse customers, otherwise the advance is reflected in higher base prices. The warehouse base price for hot-rolled strip, for example, has been advanced from $5 to $5.20 per 100 pounds despite fact mill base price for this item was not increased. Increase in freight rates has been a factor in this connection for distributors who obtain hot-rolled strip from outside this district. However, more important is the fact most warehouse interests refuse to take 10 per cent of a specific order in short lengths because of their inability to sell odd sizes and therefore they are subject to an additional mill charge of 10 per cent of all extras plus base price. In ordering strip under 2-inches wide an additional mill extra is charged for rolled edge.

In addition to upward revision in warehouse base prices there has been adopted an important change in quantity brackets.

The new warehouse base prices per 100 pounds are: Hot-rolled bars $5, up 10 cents; cold-finished carbon bars $5.75, up 35 cents; hot-rolled 4140 alloy annealed $9.55, up 35 cents; hot-rolled sheets $5.05, up 15 cents; cold-rolled sheets $5.80, up 5 cents; galvanized sheets $6.70 for new base width of 24 to 30 inches; hot-rolled strip $5.20, up 20 cents; standard shapes and CB's are now one price of $5.05, up 15 cents for standard shapes and 20 cents for CB sections; carbon plain plates $5.15, up 10 cents; floor plates $6.40, off 15 cents.

Cleveland—Considerable confusion prevails in the local steel warehouse trade because of pricing difficulties stemming from the recent sharp increase in mill prices and extras. Distributors have been burning the midnight oil to develop new price schedules and this week the market appears to have fairly solidified.

Currently Cleveland warehouse prices are up $5 per ton on hot-rolled sheets, $2 per ton on cold-rolled sheets, $5.20 on hot-rolled strip, $3.40 on hot-rolled bars, $7 on cold-finished bars, $6.20 on hot-rolled alloy bars, $4.20 on standard shapes, $3.20 on carbon and $1.40 on floor plates.

Chicago—Of more interest to some metalworking plants than the new warehouse base prices which have finally been posted on most products is the new schedule of quantity extras. As put in effect by several distributors these are: Orders of less than 100 pounds take an extra of $3, from 100-399 pounds $1.50, from 400-999 pounds $0.70, from 1000-1999 pounds $0.20. Base quantities are from 2000 to 9999 pounds. Orders of from 10,000-19,999 pounds earn a deduction of $0.20, and orders which total 20,000 pounds or over $0.40. Under this system all hot-rolled material on one order can be lumped to earn the lesser extra or the deduction. Similar quantity extras apply on all cold-rolled and galvanized purchases, but these cannot be included in the total quantity of hot-rolled material.

Philadelphia — Local warehouse prices are being revised with a new quantity differential plan applicable as follows: under 100 pounds, plus $3; 100 to 399 pounds, plus $1.50; 400 to 999 pounds, plus 70 cents; 1000 to 1999, plus 20 cents; 2000 to 9999 pounds, base; 10,000 to 19,999 less 20 cents; 20,000 pounds and over, less 40 cents.

Cincinnati — Warehouses have raised base prices in line with mill advances, and have conformed with industry-wide revisions in extras.

Milwaukee—With publication of new mill prices, warehouses generally raised their city delivery charges to 20 cents per 100 pounds, the rate which has been in effect in Chicago for several months.

Los Angeles—Activity of distributors has regained its preholiday level, although business is far from spectacular.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 88

Philadelphia—Unsettled labor situation in coal has stirred up livelier interest in foundry coke although having little effect to date on demand for pig iron. Consumers are concerned over their ability to obtain high standard coke because of the growing shortage of the better grades of coal.

MICHIGAN

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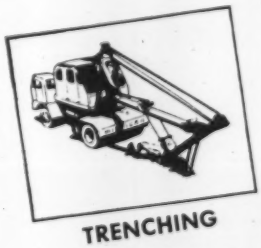

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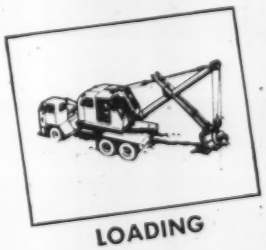

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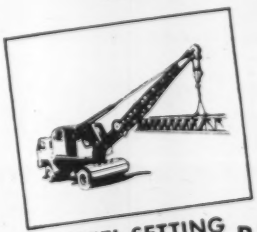
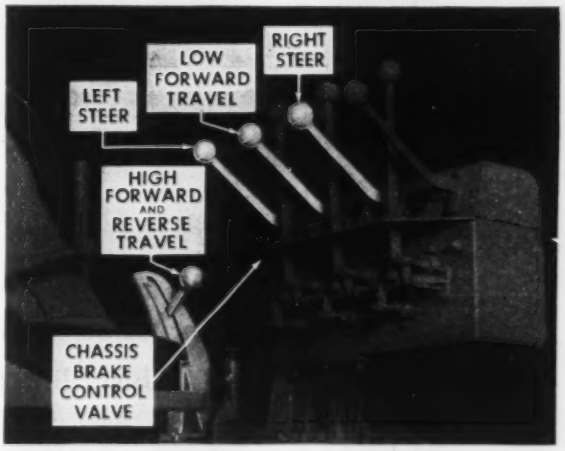


STEEL SETTING



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Rails, Cars . . .

Track Material Prices, Page 87

Chicago—Requirements of the railroads for new track and accessories are estimated to be somewhat lower in 1950 compared with last year. Buyers are extremely finicky and insistent that deliveries be made during the track-laying season. Orders for perhaps the first three quarters of the year will be substantial.

Seattle—Railroad orders for this year's supply of tie plates, track bolts and other supplies may be expected this month.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

6500 tons, state bridge over Severn river, Anne Arundel county, Maryland, to Harris Structural Steel Co., New York.

4600 tons, Massachusetts Mutual Lite Insurance Co. office building, 48th St. and Fifth Ave., New York, through Turner Construction Co., to Bethlehem Steel Co.

3000 tons, highway bridge, Little Calumet river, Calumet City, Ind., to American Bridge Co., Pittsburgh.

900 tons, Presbyterian nurses home, Chicago, to American Bridge Co., Pittsburgh; R. C. Wieboldt Co., general contractor.

600 tons, carton plant, Kieckhefer Container Co., Delair, N. J., to Bethlehem Fabricators Inc., Bethlehem, Pa.

500 tons, double leaf bascule bridge, navigation locks, McNary dam, to Willamette Iron & Steel Corp., Portland, Oreg., low $419,839.

400 tons, Johnson & Johnson research laboratory, Milltown, N. J., to Elizabeth Iron Works, Elizabeth, N. J.

325 tons, Beth El Hospital addition, Brooklyn, N. Y., to Schacht Steel Construction Co. Inc., New York.

325 tons, Skokie bridge, Edens superhighway, Cook county, Illinois, to American Bridge Co., Pittsburgh.

295 tons, state highway bridge, Lebanon county, Pennsylvania, to Belmont Iron Works, Eddystone, Pa.

260 tons, bandstand, Ravinia Park, Highland Park, Ill., to American Bridge Co., Pittsburgh.

240 tons, Carpenter road bridge, Edens superhighway, Cook county, Illinois, to American Bridge Co., Pittsburgh.

220 tons, Oakton street bridge, Edens superhighway, Cook county, Illinois, to American Bridge Co., Pittsburgh.

215 tons, three-span continuous rolled beam bridge, end spans 50-foot with 63-foot center span, relocation, U. S. route 1, Fulton Terrace, New Haven, Conn., to Bethlehem Steel Co.; Blakeslee Construction Co., New Haven, general contractor.

210 tons, Grosse Point road bridge, Edens superhighway, Cook county, Illinois, to American Bridge Co., Pittsburgh.

177 tons, business structure for Lloyd Corp., Portland, Oreg., to Gunderson Bros., Portland.

150 tons, 150-foot two-span continuous rolled beam bridge, Hebron avenue, over East Hartford-Glastonbury expressway, Glastonbury, Conn., to Bethlehem Steel Co.; Brunnelle Construction Co., Southington, Conn., general contractor.

150 tons, addition, Pulaski school, Chicago, to American Bridge Co., Pittsburgh; Superior Construction Co., general contractor.

120 tons, elementary school building, Needham, Mass., to West End Iron Works, Boston; Vara Construction Co., Boston, general contractor; Truscon Steel Co., Boston, awarded reinforcing bars.

100 tons, bridge, Ft. Wayne, Ind., to American Bridge Co., Pittsburgh; Ruckman-Hanson Co., general contractor.

STRUCTURAL STEEL PENDING

3000 tons, (previously reported unstated) addition to University of Washington stadium, including cantilevered roof; bids to Board of Regents, Seattle, Jan. 10.

1500 tons, bridges, route 128, Needham-Wellesley-Newton-Weston, Mass.; bids in to state Department of Public Works, Boston.

1258 tons, including 308 tons of plain structural steel, state bridge work, Schuylkill county, Pennsylvania; bids Jan. 27; also 392 tons of reinforcing bars.

600 tons, state bridges, Reading-Woburn, Mass.; Lane Construction Co., Meriden, Conn., low on general contract.

550 tons, state bridge, Carbon county, Pennsylvania; bids Jan. 20.

500 tons, renovation of White House, Washington; bids closed Jan. 6 through John McShain Inc., Philadelphia, general contractor.

450 tons, 404-foot twin span through truss bridge, Lancaster, N. H.; bids Jan. 12, State Highway Commissioner, F. D. Merrill, Concord, N. H.

380 tons, warehouse, International Text Book Co., Scranton, Pa.; Breig Bros., that city, low on general contract.

310 tons, cancer research building, Massachusetts General hospital, Boston; bids in.

292 tons, state bridge, Northampton county, Pennsylvania; Murphy Construction Co., Harrisburg, Pa., low on general contract.

240 tons, bridge, New Jersey state turnpike; Poirier & McLane, New York, low on general contract

240 tons, state highway bridge construction, Lynnfield-Wakefield, Mass.; Taurasi Construction Co., Boston, low on general contract.

200 tons, store, J. C. Murphy Co., Harrisburg, Pa.; bids closed Jan. 5.

200 tons, elementary school, Upper Darby, Pa.; bids Jan. 9.

200 tons, state highway bridge, Burlington, Mass.; Lane Construction Co., Meriden, Conn., low on general contract.

185 tons, 12.9-mile section East low canal, Columbia Basin project; bids to Bureau of Reclamation, Ephrata, Wash., Feb. 2.

170 tons, hospital, Waymart, Pa., for general state authority, Harrisburg, Pa.; Tabone & Barbera, Pittstown, Pa., low on general contract.

140 tons, Manasquan river bridge approaches; bids to be closed by New Jersey State Highway Commission, Jan. 12.

135 tons, state highway bridge, Danvers, Mass.; bids Jan. 10, State Department of Public Works, Boston.

130 tons, also 75 tons reinforcing bars and rails, road and bridge project near Moses Lake, Wash., Columbia Basin project; bids to Bureau of Reclamation, Ephrata, Wash.; spec. No. 2876.

125 tons, state highway bridge, Lincoln, Mass.; bids Jan. 10, state Department of Public Works, Boston.

100 tons, city bridge, Tabor avenue, Philadelphia; bids asked.

Unstated, bridges and other projects, East low canal, Columbia Basin project; bids to Bureau of Reclamation, Ephrata, Wash.; spec. No. 2877.

Unstated, tower bodies and miscellaneous; bids to Bonneville Power Administration, Portland, Oreg., Jan. 6; spec. No. 4920.

Unstated, 300-ton traveling crane and 20,000-gal. elevated steel water tank, for Detroit dam; bids to U. S. Engineer, Portland, Oreg., Feb. 3.

REINFORCING BARS . . .

REINFORCING BARS PLACED

316 tons, flood wall, U. S. Engineers, Newport, Ky., to United States Steel Supply Co.

REINFORCING BARS PENDING

1300 tons, power station, Elrama, Pa.; bids asked.

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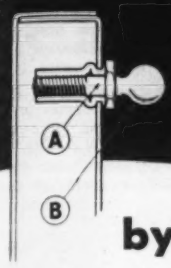

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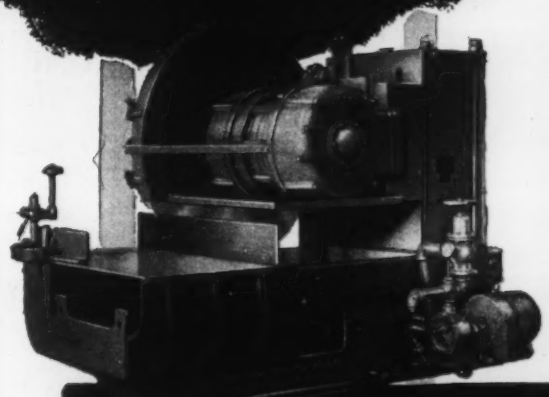
Modern Sawing



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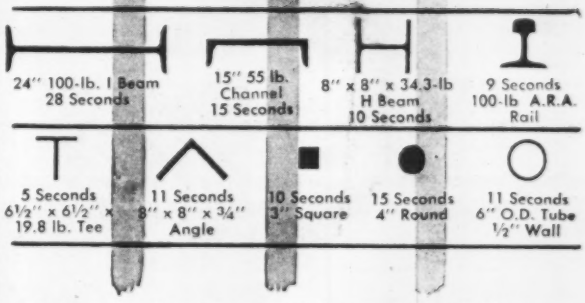

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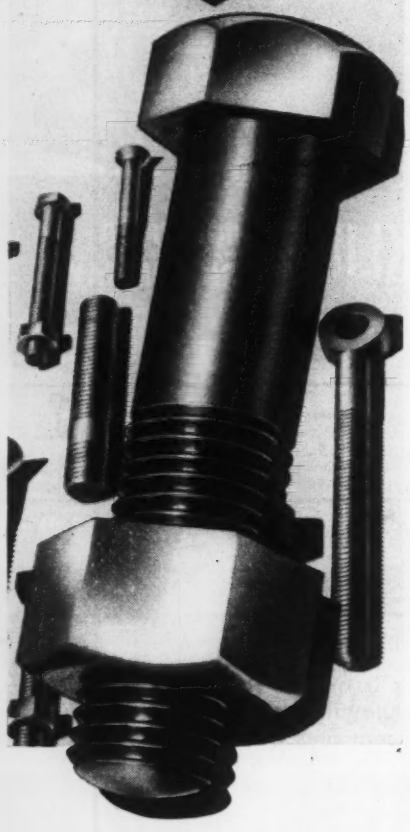

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1110 tons, building, Equitable Life Assurance Society, Indianapolis; bids asked.

690 tons, flood protection project, Covington, Ky.; bids asked.

600 tons, three tanks, Esso Standard Oil Co., Linden, N. J., to Bethlehem Steel Co.

250 tons, section East low canal, Columbia Basin project; bids to Bureau of Reclamation, Ephrata, Wash., Feb. 2.

196 tons, store, J. C. Penny Co., Chicago; bids asked.

125 tons, feline house, Woodland Park zoo, Seattle; Dale R. Peterson, Seattle, low $307,916. (Figure exceeds estimate.)

119 tons, Piedmont school, Duluth, Minn.; bids asked.

117 tons, building, Helena Rubenstein Beauty Salon, Chicago; bids asked.

107 tons, power house, state penitentiary, Pontiac, Ill.; bids asked.

PLATES . . .

PLATES PLACED

865 tons, Department of Navy, to Lukens Steel Co., Coatesville, Pa., $29,643.77.

250 tons, H-piling, first section Seattle viaduct, to Bethlehem Pacific Coast Steel Corp., Seattle; MacRae Bros., Seattle, general contract.

PLATES PENDING

200 tons or more, Rockwood water district, Portland, Oreg.; Coast Construction & Engineering Co., Portland, low $42,630 for 11,000 ft. 12 inch steel water pipe; H. D. Fowler, Seattle, for Pittsburgh Des Moines Steel Co., low $31,189, for 200,000-gal. elevated water tank.

Unstated, 1000 feet, ¼-inch steel water pipe; bids in Dec. 29 to city clerk, Everett, Wash.

RAILS PENDING

United States Engineer, Walla Walla, Wash., Jan. 20 relocation of Spokane, Portland & Seattle and Union Pacific railroads, McNary dam projects, involving 7120 tons, 115 lb rail and 3430 tons, 133.4 lb rail, also 650 tons tie plates, spokes, bolts, etc.

CONSTRUCTION AND ENTERPRISE

OHIO

CAREY, O.—Wyandot Dolomite Inc., a new corporation, has asquired the Adelsperger farm at the north edge of Carey where a quarry will be opened and a modern crushing, screening and drying plant will be built with rail shipping facilities to be serviced by the New York Central Railroad. Incorporators of the new company are Dr. R. E. Carrigan of Tiffin, and V. C. Lytle and J. W. Grimm of Findlay, O. Offices will be located in Findlay.

CINCINNATI, O.—Headquarters for a new company to manufacture a revolutionary heating unit for steelmaking furnaces will be set up here, probably in a surplus government plant outside the Cincinnati area, but with headquarters here. The company, including men from both Cincinnati and Cleveland, will manufacture a unit which will burn homogenized oil and water, by which process it is believed speed of steelmaking can be at least doubled. G. A. Stifel, who operates the Radio & Refrigeration Supply Co., 1220 Jackson St., probably will head the new company.

CLEVELAND—Manufacturers Iron & Metal Co. has been chartered to manufacture and deal in metal and metal products, etc. Incorporators are S. S. Kates, attorney, Hippodrome Bldg., W. H. Stone and David R. Hertz, attorneys.

ELYRIA, O.—An expansion program underway at American Radiator & Standard Sanitary Corp. plant will result in considerably larger manufacturing capacity. New facilities and modern equipment will be installed for producing the American-Standard line of winter air conditioners and warm air furnaces. As the first step in the expansion program, $25,000 will be spent on remodeling of its office building.

JACKSON, O.—Sale of Crown Pipe & Foundry Co. Inc. to James M. Hill, former president, Empire Steel Co., Mansfield, and William D. McCabe, account executive with Vercoe & Co., Columbus, O., has been disclosed. Mr. Hill was named president of the new company; Mr. McCabe, vice president; M. M. Rhyan, secretary-treasurer.

TOLEDO, O.—Cambria Mining Co. has been incorporated to manufacture and deal in goods of all kinds and deal in mining coal, minerals, ores, etc. Incorporators are Charles R. Brown, Swift C. Corwin, and G. Charles Scharfy.

TOLEDO, O.—Lockseal Nut Corp. has been formed to manufacture and deal in locknuts and washers. Harry L. Haskell, Sulphur Springs Rd., is named agent and an incorporator. Other incorporators are Paul W. Kirchmaier and Stephen J. Balog.

WARREN, O. — Thomas Steel Co. has awarded a contract for a modernization program at its local plant. The work will consist mainly of erecting a three-stand tandem cold reduction mill and making necessary building changes. Mechanical equipment for the new mill will be supplied by United Engineering & Foundry Co.

PENNSYLVANIA

FRANKLIN, PA.—A large shop and office building will be constructed by Joy Mfg. Co. on its property at First street, between Elk & Liberty streets. Plans are still in the preliminary stages. Joy recently closed its Breckenridge plant in Cleveland and it is planned to house the facilities of the plant in Franklin.

SOUTH CAROLINA

CHARLESTON, S. C.—Woodstock Mfg. Co. Inc., L. R. Culler, general manager, has construction underway on new plant to replace one recently destroyed by fire; Dotterer Engineering Co., engineer and contractor for foundation and floors; Armco Drainage & Metal Products Co., engineer and contractor for buildings.

UTAH

SALT LAKE CITY, UTAH—Utah Oil Refining Co. will spend $1.8 million on new warehouse and loading facilities at its plants in Utah and Idaho. Utah Power & Light Co. will build a $150,000 building to house construction and maintenance crews and a drafting department in Utah county.

FERROALLOYS

(*Continued from Page* 89)

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk, 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.05% C 29.25c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. And 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

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25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls,

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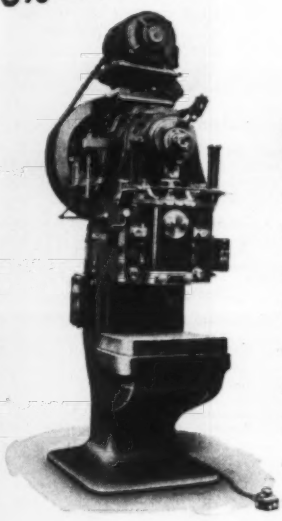

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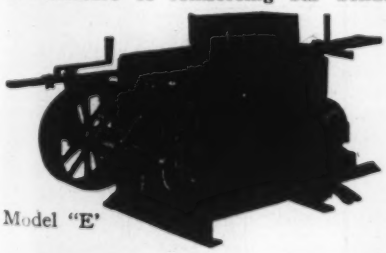

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